

SHIPBUILDING AND SHIPPING RECORD

A JOURNAL OF SHIPBUILDING, MARINE ENGINEERING, DOCKS, HARBOURS AND SHIPPING

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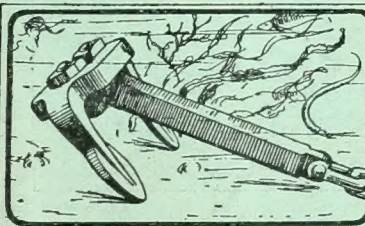
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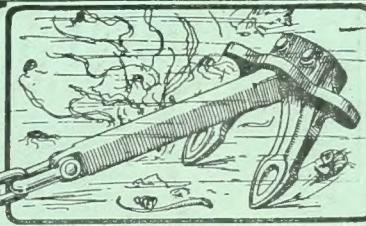
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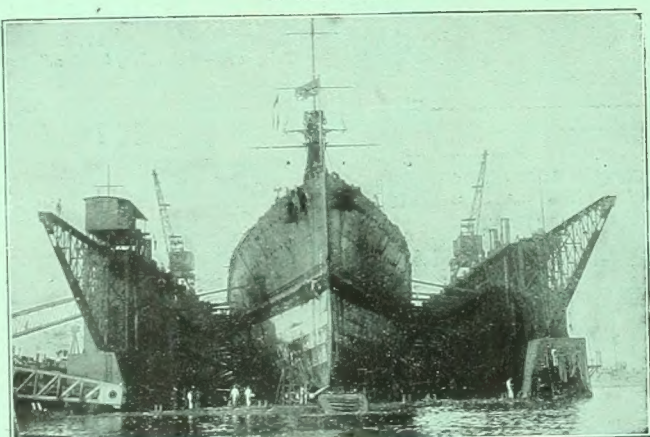


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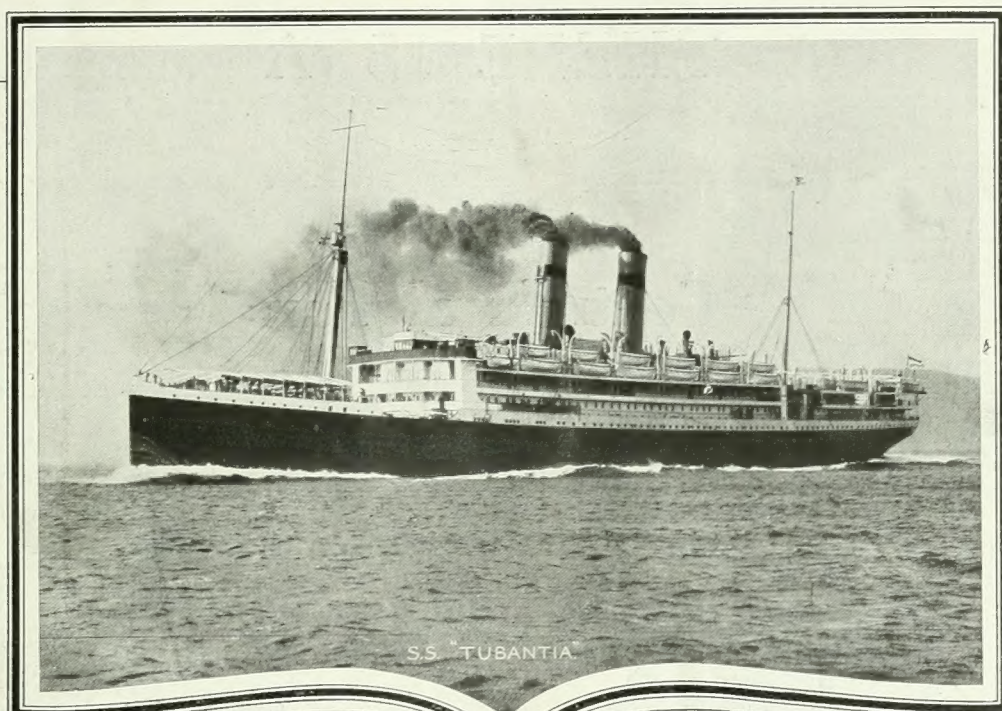
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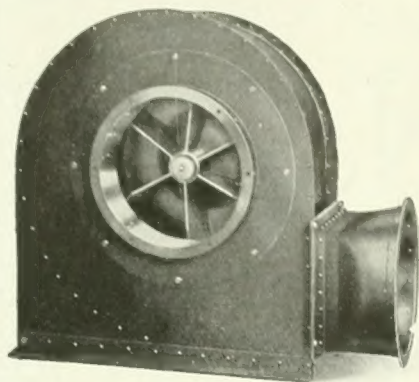
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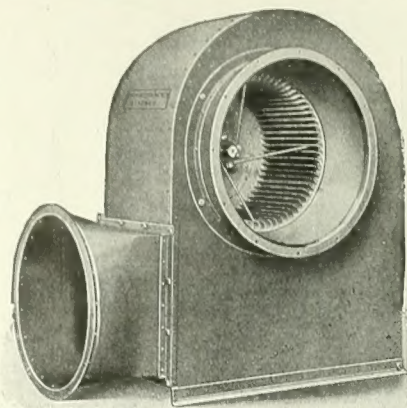
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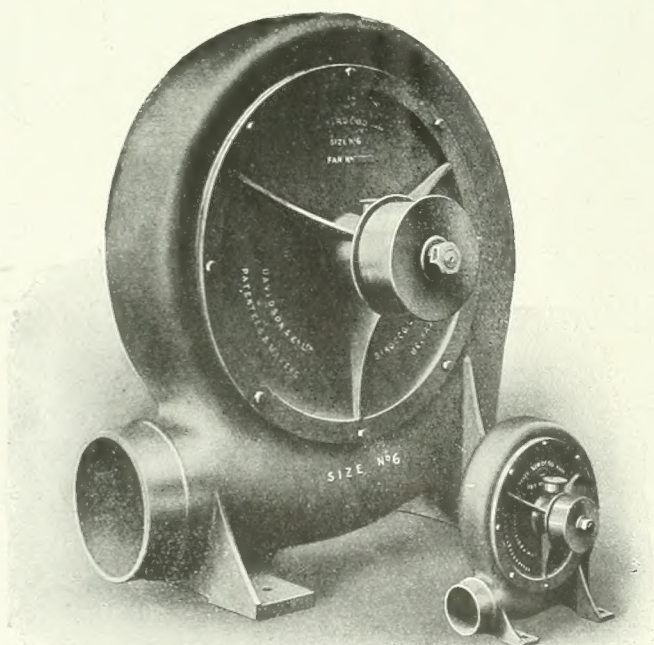
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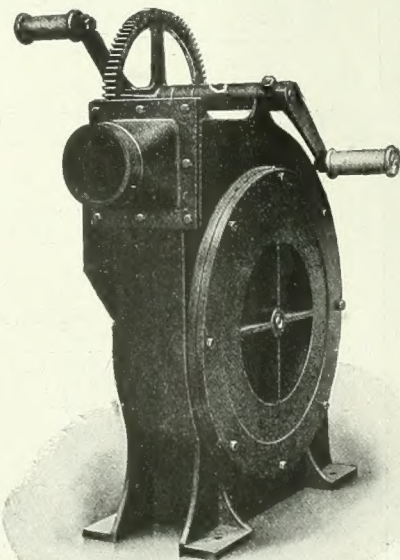
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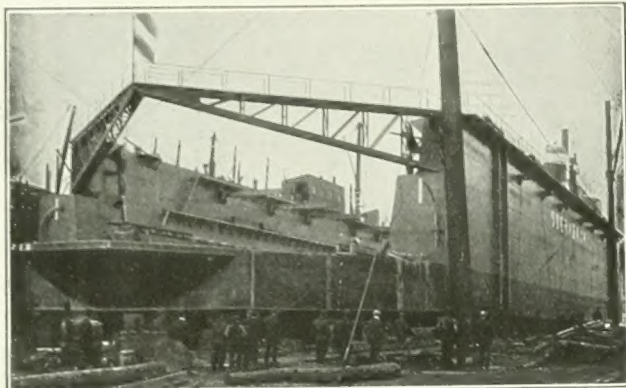
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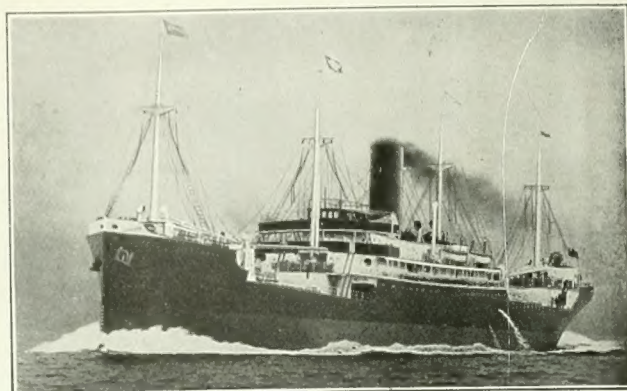
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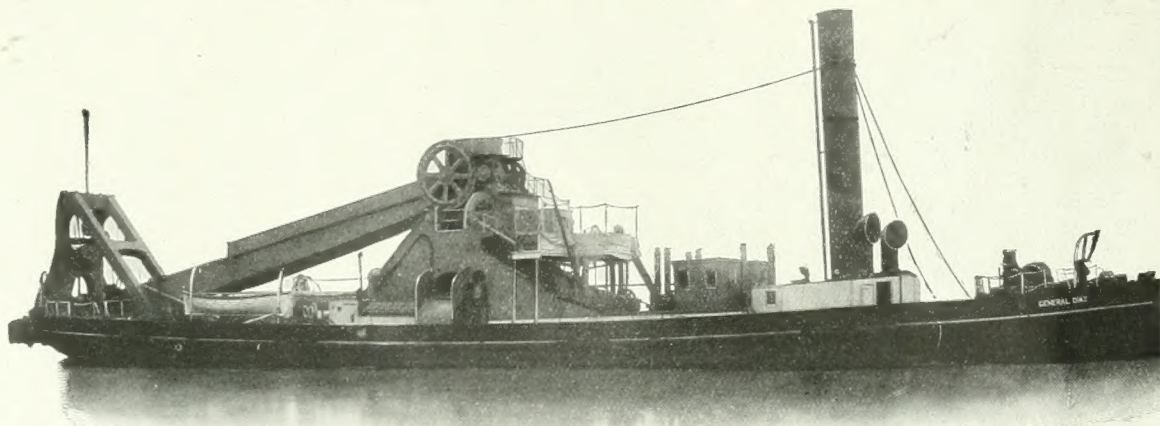
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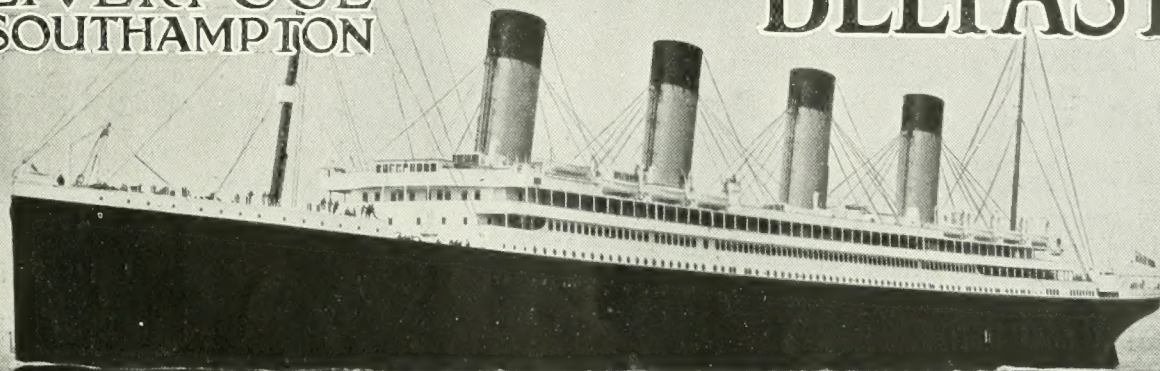


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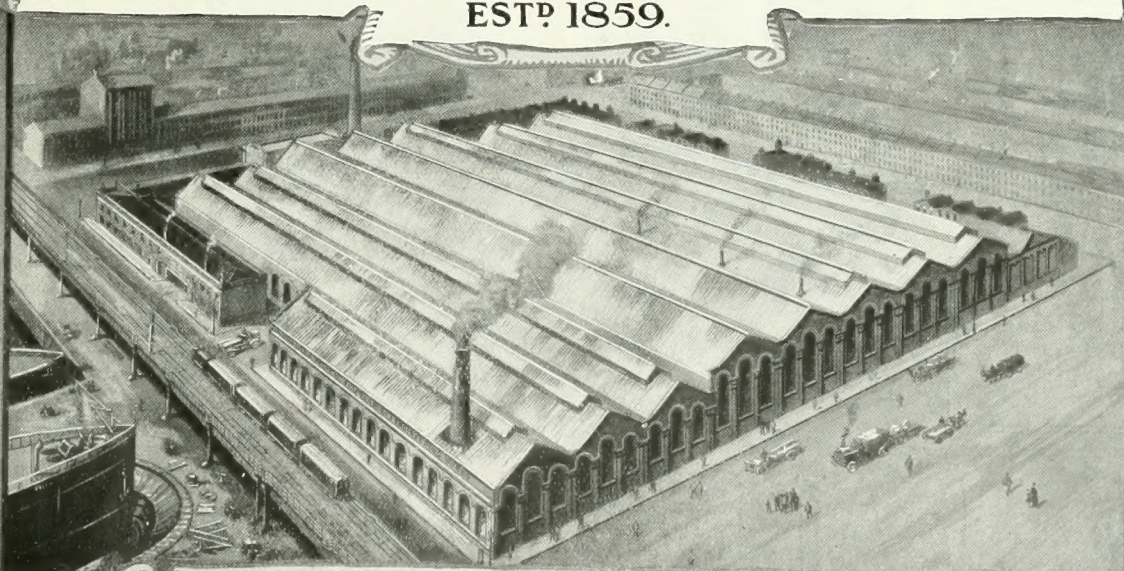
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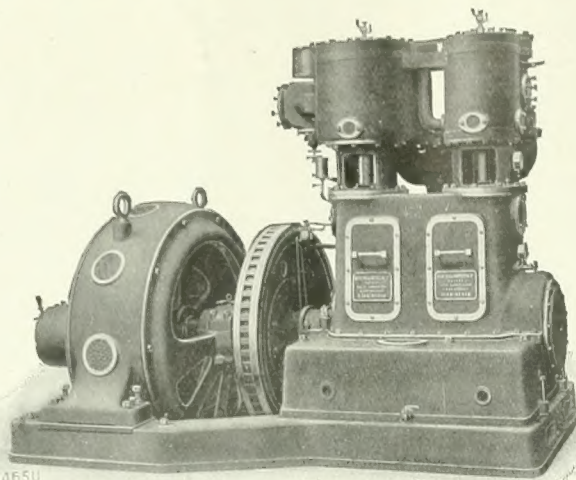
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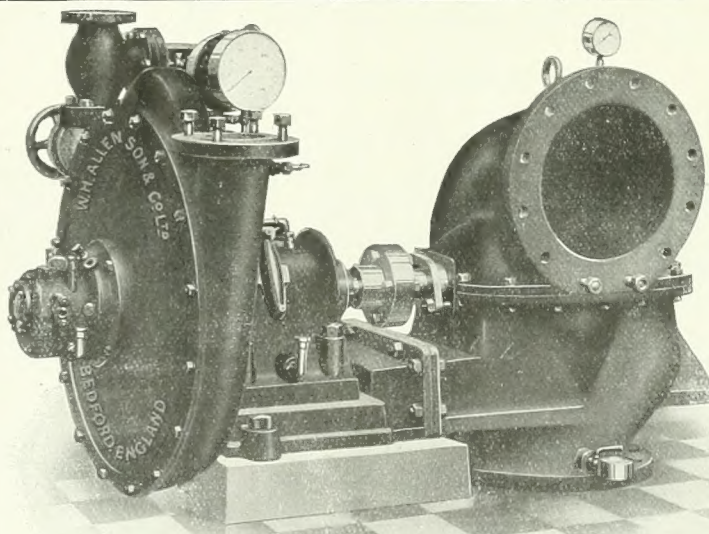
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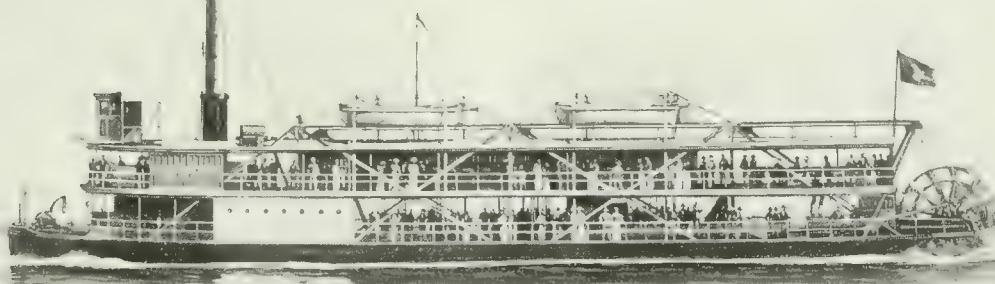
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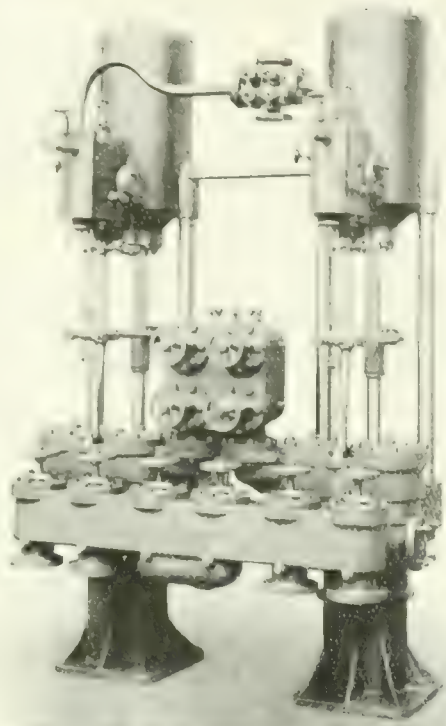
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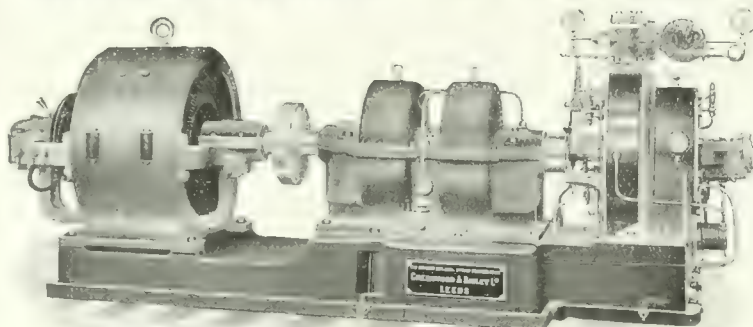
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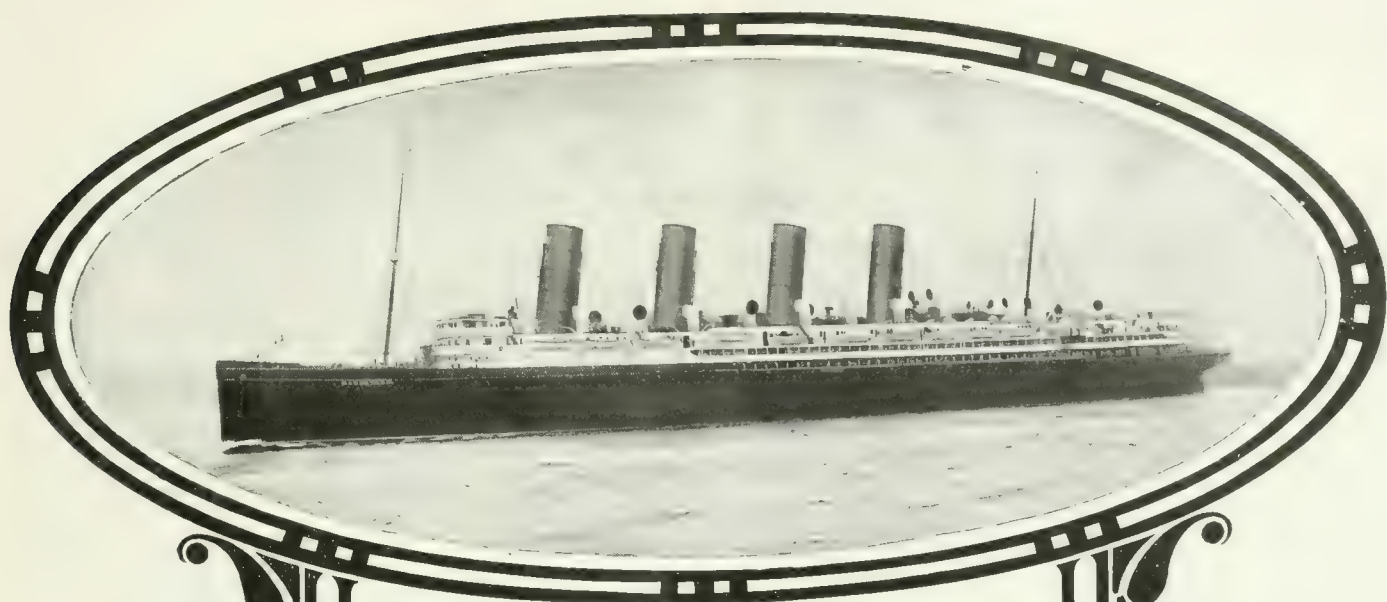
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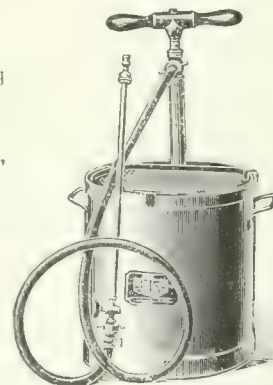
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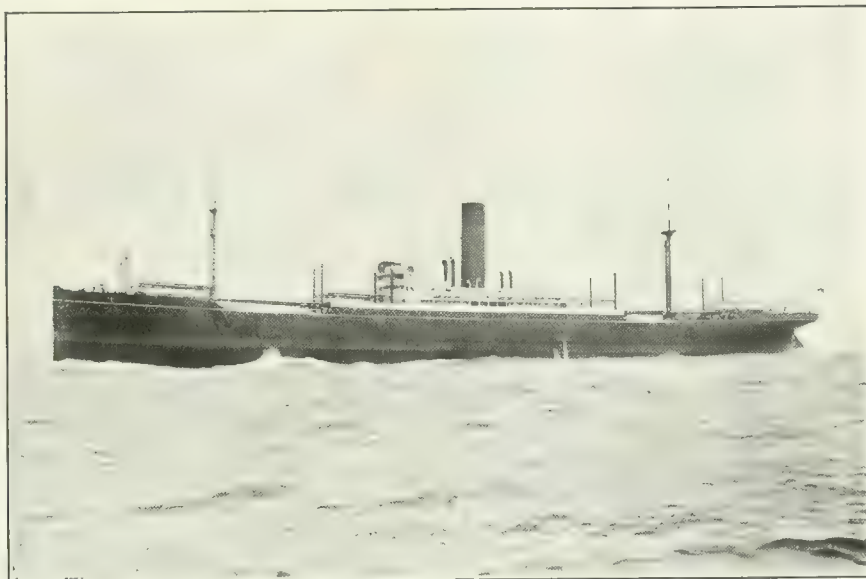
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25th November, 1915.

Sir,

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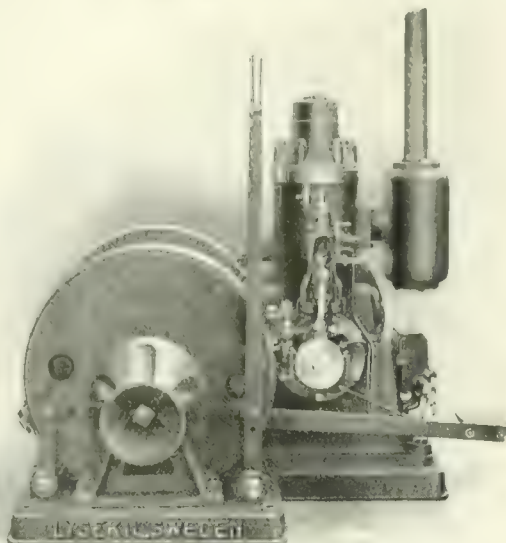
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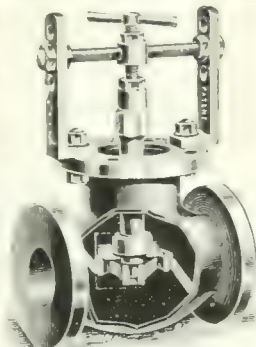
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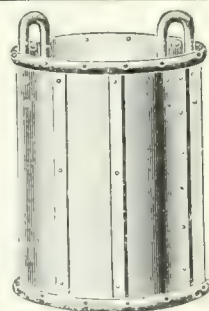
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regard to neutrals ought not invariably to constitute the last word. As Foreign Minister of a neutral State he had difficulties to adjust on such subjects during the Russo-Japanese War. Speaking again as a member of the British Government he clearly contemplates the principle of arbitration in respect to cases of disputes in this sphere with the United States. This country has a treaty providing for arbitration with America. It would be illogical, Lord Lansdowne says, to decline to look to arbitration in case of failure to arrive at an adjustment in regard to disputes arising out of the jurisdiction of our Prize Courts. There is a difference between arbitration and an International Prize Court, but we take Lord Lansdowne's remarks as an indication of the trend of the mind of the Government.

While on the whole a wonderful reticence is maintained concerning the costs which the German shipping concerns are having piled up against them owing to their ships being laid up in neutral ports, from time to time items of "Hapag" Economy. news crop up which remind one forcibly of the sorry predicament in which these companies find themselves, despite the flamboyant utterances of the directors of the leading concerns. From Boston comes the news that arrangements have been made by the Hamburg-Amerika Line for berthing the *Cincinnati* and *Amerika* at McQuessen wharf, East Boston. The ships have been laid up at the Commonwealth pier, South Boston, since the outbreak of war at a cost of \$75 per day, and the change is made as a measure of economy. Considerable dredging will be necessary to accommodate the heavy draught of the ships. Three liners owned by the North German Lloyd, the *Köln*, *Willehad* and *Wittekind*, were due at the time of writing to move from an anchorage in President's Roads to berths at East Boston.

Since our note of last week, which was based on most reliable information, announcing the apparently favourable progress of this scheme, circumstances have arisen which have caused the promoters to abandon, at least for a time, the labour-saving bureau at Lloyd's, the particulars of which we published at the time of its conception. It appears that when all opposition seemed in a fair way to be overcome, a fresh outburst of criticism showed the organisers that they were without the unanimous support which was considered necessary, and rather than attempt to force an unwelcome measure on a minority they decided to withdraw it altogether. One of the reasons for this withdrawal when prospects of success seemed bright, is the fact that stress of business prevented many underwriters going thoroughly into the matter until its imminent inauguration forced it upon their attention. It is often difficult to approach an underwriter without a long wait in a queue at his box, and the actual business of underwriting has, perforce, occupied members' attention to the exclusion of details of administration. Whatever the reason may be, it is hoped that the scheme is only dormant and that at a more favourable moment it will again be brought into being and achieve the success it deserves.

Excellent though the Government war risk insurance scheme has proved itself to be, there are still circumstances which force shippers to seek cover in the open market, and the high rates which have been paid recently in voyages from the East via Suez Canal to this country and the United States furnish instances of this.

The fact that no insurances can be placed under the Government scheme when the vessel has sailed, forces the shipper who has received late advices to seek cover elsewhere, unless he decides to run his own risk to the first port of call from which he can insure his goods with the Government. Then, again, should the goods appreciate in value during the voyage the increased value is not placeable except in the open market, which is probably already full in the case of a large shipment, while the requirement of the

At this period of the war, we should scarcely have thought that it would have been necessary for Lord Lansdowne to make a speech in the House of Lords for the purpose of removing misapprehensions as to the position of the Declaration of London to law and policy in this country. His speech, like all his utterances, was marked by admirable lucidity, but the character of this document in relation to British law

was stated in this Journal during the first weeks of the war in much the same terms as Lord Lansdowne used last week. The Declaration of London as such possesses no legal validity. It has never been ratified, and although in the first instance we used it with considerable modifications to regulate the relations of neutrals to our prize law, we did so in virtue of an Order in Council. And an Order in Council may be revoked or modified by another. This course we have taken, and in practice we are now rejecting considerable portions of the doctrines contained in the Declaration. The part of Lord Lansdowne's speech to which we turn with liveliest interest concerns the situation which arises out of disputes with neutrals over Prize Court proceedings. How are they to be met? The Naval Prize Bill was intended to sanction appeals from our national Prize Courts in which neutrals were concerned, to an international Prize Court at the Hague. The Declaration of London was framed with the idea of providing a code of law for the international tribunal to administer. Neither the International Prize Court nor the Declaration has ever been brought into force. Although Lord Lansdowne, when the Naval Prize Bill was before Parliament, found the actual terms of those projects mischievous and dangerous, he has been consistent in his admission that the decisions of the Prize Courts of belligerents in

Government that the vessel in which the goods are carried should be insured with them has frequently in the past been unfulfilled owing to the fact that until recently Eastern voyages could be done cooperatively by several trading companies in conjunction with the Government. All these circumstances combined have directed a large flow of business to the open market, which, having lost some of its elasticity, proves an expensive matter for the shipper who finds himself unable to get a refund from the Government Scheme.

In his speech to the trade union delegates who met in London last week for the purpose of framing amendments to the Munitions of War Act Mr. Lloyd George made a point which it was quite clearly time somebody in authority made in the hearing of the men. Representatives of Labour never tire of telling us how in the interest of the soldiers in the trenches they have agreed to suspend during the war period a great many of their "hard-won trade rights and privileges." As most people know, some of the men have not agreed to the suspension with very good grace. Still, all trade union restrictive rules, practices and customs are nominally suspended, and at any rate a proportion of the men are entitled to credit for that. Apparently, one or two of the speakers who criticised the Act harped once more on the sacrifices the men were making, for in the course of his reply the Minister of Munitions pointed out that while the Act "interfered to some extent with the liberties of the workman," it gave the Ministry of Munitions "powers over controlled establishments which cut quite as deeply into the rights of private employers as any provision affecting workmen." In the negotiations preceding the Treasury Agreement and also in those which ended in the Munitions Act their representatives declined to give way on any point until the profits of employers were limited—and the control of their businesses was to all intents and purposes taken out of their hands. Employers are, in fact, much more seriously affected by the Act than workmen.

People whose knowledge of the shipbuilding and engineering industries is intimate are not, we imagine, very sanguine that the weighty words which Mr. Asquith, Mr. McKenna and Mr. Runciman addressed last week to Trade Unionists generally will have much effect on the average operative. The fact need not be left obscure that it is the attitude of the providers of ships and munitions of war which is giving the Government most concern. These men are earning abnormally large wages, and instead of saving the money are spending it lavishly. They are, in fact, doing more than any other class to put up the cost of living, and are at the same time the most clamorous for increase of wages to compensate it. It was, in fact, their new, almost general demand for higher wages to offset the increasing cost of living that induced the Government to cause the calling of this Conference. A resolution framed by the National Advisory Committee on War Output commending the appeals made by Ministers to the "earnest and favourable consideration" of the workmen was passed by the delegates. We sincerely hope that the workmen will give them their earnest and favourable consideration, for the prospect of a new general rise of wages in all the controlled establishments and national factories is not a pleasant one for the Government to contemplate. Still, it seems to us that what is happening is just what was to be expected from the treatment which the Ministers have meted out to Labour during the past nine months. They have gone on the principle that it was better to take the trade unions with them in everything they did. Considering how arbitrary their treatment of other sections of the community was, their adhesion to such a principle left a good deal to be desired. Not the least serious defect which the policy developed was that it gave the unions an exaggerated

sense of their importance, which will very probably now express itself in disinclination to defer demands for higher wages until the Government arbitrarily reduces the cost of living.

Lord Halsbury has introduced a Bill in the House of Lords with the object of treating as enemy companies, those concerns financed or controlled by Germans which have been registered under British company law. He defines them as being those of a "predominantly enemy character." He proposes that the vessels belonging to those bodies should be confiscated and that trading with them should be treated as trading with the enemy. We have urged that the Legislature should give its attention to these companies, but we are unable to see that the Government would at this moment favour immediate legislation so wide in its scope as is Lord Halsbury's Bill. Without its goodwill and active co-operation no Act of Parliament could be passed. At the same time the subject is engaging the attention of the Cabinet. Lord Lansdowne has, indeed, intimated that the Government is particularly considering what steps it may be necessary to take after the war to prevent companies, the majority of whose shares are under foreign control, from obtaining by registration the status and privileges of British companies. But for the period of the war the Government seems to be satisfied with the policy of retaining in its keeping the assets and dividends of concerns of enemy origin which now enjoy the protection of our law. Lord Halsbury's Bill goes much further than that. It deals with things as they are now existing. Its appearance will at least ventilate the subject usefully.

Some of the principles of the law of salvage are brought out with clearness in the decision given by Sir Samuel Evans in the Admiralty Division in the case of the barque *William T. Lewis*, which was damaged very considerably in an encounter with a German submarine in the Atlantic. Two days later she was found in a derelict condition by the steamer *Balakani*, which towed her under conditions of considerable difficulty to Berehaven. The value of the *William T. Lewis*, her cargo and freight, was £10,500. The *Balakani*, with her cargo, was worth £120,000. One of the principles in salvage awards is that the remuneration to the salvor should be on a handsome enough scale to encourage him to render similar services again. In the case of derelicts a larger proportion is usually awarded to him than when the salvaged vessel has her crew on board able to render assistance in the operations. That does not exhaust the relevant considerations which must appeal to a Court. Where a costly steamer saves a vessel of relatively low value she may be ill remunerated if she is awarded the whole value of the salvaged property, but on the other hand an award of this kind would render the services useless to the owner of the latter. Therefore the Court, as it were, has to balance the equities of the case, and the general idea which usually animates it, is that the award should approximate to the amount which the owners of the salvaged property might reasonably have been willing to pay for salvage services when their vessel was in actual peril. No doubt all these considerations were running in the mind of Sir Samuel Evans when he decided that the salvage award to the *Balakani* should be £5,250, or half the value of the salvaged property. Unfortunately, a short time after rendering these services the *Balakani* was lost by striking a mine.

The Imperial Government has of late given much assistance to the Canadian authorities in connection with the movement of products from the Dominion, and since Sir Robert Borden returned home from his visit to London, more vessels have been placed on the route. As regards general trade, the Transport Department of the Admiralty is, subject to military necessity, prepared to do everything possible, and not only has it refrained

recently from requisitioning ships on the Canadian route, but it has temporarily released a number of Canadian liners from war service. The war has, naturally, interfered with developments on the Western seaboard, but it is of some significance that three Canadian Pacific boats, the *Empress of Russia*, *Empress of Asia* and *Empress of Japan*, which have for a number of months been employed in Government work, are now being re-fitted at Hong Kong for their usual passenger and cargo business. The completion of a floating dry dock at Prince Rupert is a splendid addition to the shipping facilities of the Pacific Coast, and very soon, it is understood, a beginning will be made with the construction of a mammoth graving dock at Vancouver. On the Eastern seaboard, work on the new ocean terminals at Halifax, N.S., is making good progress, and when all the berths are available there will be accommodation for no fewer than 24 large ocean-going steamers, whilst the Nova Scotian port will at the same time be in a position to compete with New York for the overseas passenger trade of Chicago and other western cities. Unfortunately, the shortage of labour, as a result of the war, has interfered considerably with the export of grain this year by way of the St. Lawrence to the advantage of American ports, but when conditions are again normal, and the enlarged canal between Lakes Erie and Ontario is ready for traffic, it is quite expected that the difference in this respect will be much more favourable to the Dominion.

Our note on "artificial waves" which appeared in these columns a fortnight ago has brought forth an interesting letter from Sir Archibald Denny, which is given on page 510.

Artificial Waves.

In our note it was stated that, as far as we were aware, no experiments had been made with full models among artificial waves. Sir Archibald points out that such have been carried out in the Dumbarton tank, with complete success. It is interesting to have the confirmation which he gives, that in even full ships, different forms of the fore body have a material influence on the resistance amongst waves. We presume that the straighter and finer the lines are forward, the less would head seas affect the speed. This interesting communication gives a sidelight into the many important results which have accumulated at the Denny tank. In his recent address to the Institution of Marine Engineers Sir Archibald said a great deal about important propeller experiments which his firm had conducted, and in many instances his remarks on papers read before the Institution of Naval Architects have been illustrated by instructive experimental data. On the whole, however, the volumes of the latter institution do not contain as much as one would wish about the Dumbarton tank and the work accomplished there. In spite of his many activities, it is to be hoped that Sir Archibald, in some future communication, will give further information regarding the interesting experiments to which he refers in his present letter, and also speak of the many other problems which his experimental tank staff has been called upon to solve.

Mr. Baker made some rather startling statements at Newcastle regarding the economies effected on various forms, as the result of tank experiments. Reductions in horse-power ranging from 4 to 42 per cent. had been effected, and the return to the shipowner on the money laid out on the experiment was sometimes about 300 per cent., and sometimes more like 3,000 per cent. per annum. Thus the expenditure of £200 on model experiments has actually in certain cases saved £6,000 a year. At the first blush the statement looks as if some explanation were required, but if 200 steaming days be assumed and a consumption of 1.5 lb. per i.h.p. per hour, it will be found that this would mean a reduction of under 2,000 h.p., assuming coal at £1 per ton. Such a reduction is quite possible in certain cases; the fact that the resistance of one particular form has been reduced by 42 per cent. shows this to be so. It is surprising to learn that only nine firms in this country not possessing

tanks themselves have been go-ahead and progressive enough to have their boats tested in order to see what was the best they could do. Mr. E. H. Rigg, in a paper recently read before the American Society of Naval Architects and Marine Engineers on the Determination of the Resistance of Ships and the present-day Status of the Art, refers to the attitude of American builders and owners towards tank experiments. He says:—"Shipbuilders and owners are now fully alive to the value of the tank, and are keen to take advantage of all it can teach them, to their no small benefit in coal bills and better service." In time, no doubt, the shipbuilders and shipowners of this country will get over their characteristic conservatism, and learn to appreciate the valuable guidance which may be theirs for a very small outlay, which is sure to be repaid by improved results.

In another part of this issue there will be found an abstract of a paper entitled "Superheated Steam in Marine Practice." This

Marine

Superheating.

The paper was read at the 23rd general meeting of the Society of Naval Architects and Marine Engineers, recently held in New York. The purpose of the paper was to invite attention in a general way to the position now occupied by superheated steam in marine practice, and especially to the prominent place it now occupies in the minds of shipowners and builders. To say that superheating is almost as old as the use of steam and that from very early times it was known to be extremely efficient is probably stating a platitude. Technical literature in many branches of engineering has referred at length to Watt and others who, many years ago, worked assiduously to find satisfactory methods by which they could obtain and utilise this desirable quality in steam. Watt had no steel mills and high grade steel foundries from which to obtain the necessary plates, tubes and castings with which to build satisfactory heating apparatus. These limitations prevailed to a great extent until within 15 or 20 years of the present time, and this naturally retarded the growth of the superheater. The author of the paper, Mr. Henry B. Oatley, calls attention to another factor which should not be overlooked, namely, that engineering practice was relatively crude in respect of the design of details which were in contact with the steam, and in many instances a quality of material was employed which was not entirely satisfactory even for saturated steam, but in view of the improvements that have been evolved it may be accepted that at the present time in marine practice satisfactory service can be obtained from existing designs of details when they are called upon to be in contact with superheated steam at temperatures which are not excessive.

The author of a paper entitled "Turbines versus Engines in Units of Small Capacities," which was read at a meeting of the American Society of Mechanical Engineers,

Engines for

Small

Capacities.

draws some comparisons between the relative performances of turbines and reciprocating engines, particularly in relation to their adaptation to auxiliary purposes and with special reference to the use of superheated steam. A difficulty sometimes encountered with engines using high superheat is the warping of the cylinder, the curvature being caused by the higher temperature which prevails in the metal next to the steam chest. Precaution is taken by some builders to avoid such trouble by leading the steam by two independent pipes, entirely separate from the cylinder, from the throttle directly to the steam valves. For auxiliary machinery it would appear that turbines which experience little difficulty from high temperatures will be more and more widely adopted while reciprocating engines will be less commonly used, especially so as steam pressures and superheats are constantly increasing, it being not unusual for new plants to be designed to carry from 200 to 225 lb. with superheats of 150° Fahr. and over. With steam

engines running under high vacuum, above 27 in., the great volume of steam to be handled increases the size of the engine cylinders, and the size of ports through which the steam must pass, to such an extent as to make the engines very expensive, if not of impracticable construction. The cost of an engine which would permit of complete expansion to such a terminal pressure, together with the increase in cylinder condensation, due to the greater range of temperature, would make the high vacuum undesirable. The turbine, on the other hand, can be designed to operate on very low terminal pressures with comparatively slight increase of cost; its action as a heat machine is such that a greater expansion can be utilised, and the economy is greatly improved by an increase in vacuum. When run non-condensing, as is well known, the turbine is less economical than the non-condensing engine.

NOTES ON MODEL EXPERIMENTS.

At times one is inclined to wonder at the immensity of the field open for investigation in matters concerning the resistance and propulsion of ships. In the few years during which the Teddington tank has been in operation many interesting problems have been faced, and a wealth of information has been made public as the result of the investigations carried out by Mr. Baker and his staff. Probably none of his previous papers has attracted so much attention as that recently delivered on the above subject. This may be due to the variety of subjects dealt with and to the fact that the paper was read at an Institution other than the Naval Architects'. During the meetings of the latter Institution so many papers are given that even one of exceptional importance does not receive the general attention that is its due.

The paper and supplementary lecture contained a judicious blending of matters of both theoretical and practical importance. Mr. Baker's work on frictional resistance has demonstrated that experiments on planks of great length are not necessary, as he has introduced a system of plotting which shows the regularity of the diminution of the frictional resistance per square foot of surface with increase in length. The experiments on the effect of the edges and butts of shell plating on the resistance appeals to the practical man as well as to those interested in the theoretical side of naval architecture. The importance of having flush plating at the forward part of a ship was clearly shown. In this connection it would be interesting to discover what the added resistance would be in vessels with outside buttstraps. There are probably not many thus built, but when the resistance due to lap butts is so considerable the additional resistance must be much greater in vessels with outside straps.

Mr. Baker's experiments on struts have demonstrated the uselessness of attempting to ascertain the resistance of full-sized brackets or bossings from small-scale experiments. In this connection a point of interest may be raised. In other work carried out on models fitted with bossings it has been shown that horizontal bossings are much more resistant than those sloped normal to the shell. Associated with horizontal bossings, however, there is a high hull efficiency value, with outward-turning screws. Is it possible that in full-sized ships this resistance is not nearly so great as the small experiments show, and the high hull efficiency value still exists? If this were so, this would point to the adoption of horizontal bossings and outward-turning screws as being advantageous. Probably, however the frictional wake in small-scale models is greater than that existing on ships, in which case the wake value would be decreased and the hull efficiency value would be materially less than that shown by small scale experiment.

The latter portion of Mr. Baker's paper, with its accompanying chart, defined the limits of the advantages of straight and hollow lines for ships. Extreme hollow is never good, but a moderate hollow forward is advantageous over a considerable range of speeds for different fullnesses of ships.

It is rather a coincidence that the results of important work of Mr. Baker on frictional resistance should be made public almost simultaneously with those of some experiments carried out in the Washington tank on the same subject. Naval Constructor McEntee recently read a paper on "The Variation of Frictional Resistance of Ships with Condition of Wetted Surface." Two important points were the subjects of experiment, viz.: On actual ships, what is the increase in resistance due to fouling? and: Is it possible to reduce the frictional resistance by modifications in the condition of the frictional surface or by the action of lubricating materials? The results of the experiments on plates which had been submerged in sea water for periods ranging from 1 to 12 months indicated the importance of keeping a vessel's bottom clean and well painted. The resistance was increased, due to fouling by as much as 300 per cent. The experiments on effect of lubrication disclosed the fact that a surface painted over with shellac offered less resistance than those covered with blacklead, light engine oil, ivory soap or heavy cylinder oil.

These two papers are sure to be thoroughly appreciated by a wide community of shipbuilders and shipowners, and a debt of gratitude is due to them for the interesting and instructive results made public.

VACUUM AND ITS EFFECTS ON STEAM TURBINES.

IN all turbine installations it is generally conceded that for economical working, condensing plant should be provided for giving a very high degree of vacuum, say from 28½ to 29 in., on a barometer of 30 in. For land purposes, in which the space available for the plant is, to a certain extent, unlimited, and where the power units are relatively small, no great difficulty has been experienced in designing turbines to utilise economically a high degree of vacuum at full load. In marine work, however, in which the space allowed for the machinery is somewhat limited, engineers usually have to be satisfied with a lower vacuum than the above stated figures, as it is not possible in some cases, especially in units of large powers and limited dimensions, to design turbines to deal economically with the increased volume of steam due to higher vacua.

In turbines of the marine direct-driven type in which a compromise has to be made between the low revolutions necessary for good propeller efficiency, and the high blade speed required for efficient working of turbines, the space available generally permits of a turbine of a moderate diameter being used, and, with an exhaust blade length made suitable for the chosen diameter, a pressure drop over the blading may be obtained for passing the requisite amount of steam, which will give a fairly high velocity ratio with the chosen vacuum.

The velocity ratio is the ratio between the mean speed of the blades and the circumferential component velocity of the steam through the blades, and, for maximum efficiency, should be about .5 for impulse turbines and about 1.0 for reaction turbines. In actual practice, however, a considerably lower figure than the above has to be chosen for exhaust blades, otherwise the length of these blades would become excessive. The blade length should not exceed about 20 per cent. of the mean diameter of turbine, in order that the losses which occur in the blading due to their radial spread may not become excessive.

In marine turbine installations of the high-speed type, in which mechanically or electrically geared slow-running high-efficient propellers are used, the turbines are usually made of a small diameter, and run at a high peripheral speed. In these turbines of smaller diameter, with their limiting blade length, the pressure drop over the blading for passing the required amount of steam will, of course, be much greater than in turbines of larger diameter, and it is seen that in order to obtain the same velocity ratio and approximately equal efficiency of blading as in the larger turbines, a very high

peripheral speed would be required. This high peripheral speed has, however, to be limited, otherwise the centrifugal stresses on the moving parts of the rotor will become excessive.

Owing to the limitations in dimensions, it is impossible in some cases, especially in units of large powers, to obtain sufficient area through the exhaust blades to maintain a moderate velocity ratio except very flat and inefficient blades be used. A turbine is said to be bladed for a certain vacuum when the velocity ratio at the exhaust end for the chosen vacuum is equal to the mean velocity ratio throughout the turbine. The capacity of a turbine for responding to high vacuum depends on the vacuum for which the turbine has been bladed, and the higher the working vacuum is above that for which the blading has been designed, the less is the proportionate gain for the heat available to the turbine. For instance, if a turbine be bladed for a 27-in. vacuum, and is made to run on a 28-in. vacuum, the increase in thermal units available to the turbine, assuming an initial steam pressure of about 200 lb. per sq. in., will be about 6 per cent., but the gain in power with the same quantity of steam flowing through the turbine will not be 6 per cent. but somewhere about half this quantity, depending on the design and type of turbine. If the dimensions of the turbines would allow suitable blading for the 28-in. vacuum then the full amount of 6 per cent. gain in power would be realised. The best vacuum for any turbine to be bladed to is the highest possible vacuum, and suitable condensing plant should be provided for attaining a somewhat higher vacuum than that for which turbine is bladed, but in some cases where the area of exhaust is restricted a moderate condensing plant would seem to be sufficient, otherwise the increase in the steam consumption of the larger auxiliaries required for the higher vacuum, together with the lower temperature of condensate, will tend to reduce to a minimum any apparent gain.

It may be mentioned, however, that any turbine which is bladed for a comparatively low vacuum at full load is quite suitable for dealing with higher vacuum at low loads, and if economy is a consideration at the lower loads, then it is advisable to provide a condensing plant for the higher vacuum, when trials of plant can decide the best vacuum to work at for the higher and maximum loads.

THE RIGHT TO TRANSFER LABOUR.

THE decision arrived at recently by the Local Munitions Tribunal for the Newcastle district with reference to certain caulkers in the employ of Palmers Shipbuilding & Iron Company, Ltd., is of much too great importance to the proprietors of all controlled establishments, be they engineering or shipbuilding, to be allowed to pass without comment. Briefly stated, the case was as follows:—Seven caulkers had finished the work on which they were engaged at the Hebburn yard. The firm desired to transfer them to similar work at the yard at Jarrow, 1½ miles away, and offered to pay the customary travelling allowances. The men refused to be so transferred and applied for their leaving certificates and insurance cards, together with whatever money remained due to them. The firm would not surrender the documents demanded, on the ground that the services of the men were not dispensed with. The men complained to the Tribunal that the firm had unreasonably withheld their leaving certificates and the firm charged the men with having disobeyed their foreman's order, by declining to proceed to Jarrow. The Tribunal found in favour of the men on both counts, and this decision, coming so closely after a somewhat similar decision given by the General Munitions Tribunal for the North-East Coast, warrants the protest that, unless some very drastic amendment be made in the Munitions Act to meet such contingencies as that which arose at Hebburn, the utility of the Act as an instrument for the facilitation of the progress of military work imperatively necessary and the elimination of the wastage of time and material, will be very seriously impaired.

The case was not, as might be thought, on all fours with that

decided by the General Munitions Tribunal. In the latter case, Sir W. G. Armstrong, Whitworth & Co., Ltd., unsuccessfully claimed the right to transfer a number of fitters from the Elswick shipyard to the Armstrong naval yard at Walker, a distance of 4½ miles, but did not propose to make any travelling allowance, either in time or money, to the workmen so transferred. In view of the great scarcity of housing accommodation in the city of Newcastle and the considerable personal inconvenience to which the workmen were likely to have been put by living—as many of them did—in the extreme west end of Newcastle, and having to journey to work at the far eastern end of the city, there was a very good case arguable from the artisans' point of view. Besides, the Elswick firm had, unfortunately, prejudiced its case before coming into court, having paid the men their "lying-on money," a transaction commonly accepted as constituting a termination of service. The Jarrow firm had not compromised its case in any degree, was willing to treat the men with the usual liberality in respect of travelling allowances, and was proposing, only, a transfer over a distance of 1½ miles easily bridged by rail or river.

The point which dictated the judgment of the Tribunal in the Jarrow case was the purely technical one that the two yards, although owned by the one firm and under the same general management, were separately controlled establishments. We make bold to say that, to deliver so important a decision on the strength of so small a point is, whilst it may be good enough law, absolutely contrary to common sense. If this splitting of legal hairs is carried much further, it will result in a firm, having two buildings precisely opposite to each other in one street, being unable to transfer workmen from one side of the street to the other without going through the formality of terminating the men's contract of service and giving them leaving certificates—thereby, of course, running the risk of losing their services altogether. The decision is decidedly inimical to that discipline and that organisation which are necessary if the industries of this country are to provide a sufficiency of war munitions to ensure the success of the Allies, and it is greatly to be deplored that no appeal from it—save to the Houses of Parliament—appears to be possible. It is to be hoped that in the real interests of the working people, as well as of the employers and the nation at large, the amending Bill will take some cognisance of such matters as are involved in this case, and will make it possible for such transferences to be effected without haggling or litigation.

The time will come when such consideration and foresight on the part of the firm will be much more appreciated by the men and when the latter will be glad to avail themselves of the services of such a clearing-house so that they will not need to walk the streets looking for work which, because of trade depression, they will be unable to find. The central labour clearing-house is, indeed, an idea which might be adopted by every large firm with scattered departments.

TRADE PUBLICATIONS.

[Copies of any of the publications mentioned in this section will be sent on application to the firms by which they are issued.]

Panama Canal Handbook.—From Wailes Dove Bitumastic, Ltd., Newcastle-on-Tyne, we have received a really useful handbook containing maps and information respecting the Panama Canal. Much of the matter therein is quite new and there are some good illustrations.

The Thornycroft Calendar.—The calendar for 1916 which John I. Thornycroft & Co., Ltd., Caxton House, Westminster, S.W., have issued has as its central figure a striking colour reproduction of H.M.S. *Lance* by Mr. Walter Thomas. Insets show a Thornycroft motor lorry and a Thornycroft motor cruiser.

Liquid Board of Trade Boat Compasses.—In view of the recent pronouncement by the Board of Trade that the "dry card" type of compass will not be passed for use on lifeboats after July 1, 1916, Dobbie, McInnes, Ltd., 57, Bothwell Street, Glasgow, have issued a four-page leaflet giving particulars of some compasses which they specially construct to conform with the Board of Trade requirements.

LETTERS TO THE EDITOR.

ARTIFICIAL WAVES.

Lt. Col. S. J. P. Ward,
Dumbarton.

December 1.

TO THE EDITOR OF SHIPBUILDING AND SHIPPING RECORD.

Referring to the editorial note in your last week's issue headed "Artificial Waves," testing experiments have been carried out at Lt. Col. S. J. P. Ward's experimental tank on different occasions to obtain information regarding both buoyancy and resistance of cargo vessels when running against head seas of certain dimensions; the first experiments being made as long ago as 1887. Quite recently similar model experiments were made to ascertain the resistance of ships over 300 ft. in length when running against head seas, and two models were tried of identical displacement, but with different entrance lines, when it was found that even in comparatively full seas there would be considerable difference in sea-going resistance for different types of the forward lines.

This was done in order to obtain confirmation, if possible, of statements made by the commanders of the two types of vessels.

These experiments are somewhat troublesome to make and take a considerable time, but in this particular instance time and trouble were well spent.

ALGERHAUD DENNY.

We deal further with this subject in a note on page 567. Ed.
S. & S. R.

THE CORRUGATED SHIP.

December 6.

TO THE EDITOR OF SHIPBUILDING AND SHIPPING RECORD.

Mr. Haver's letter in your last week's issue gave some interesting results of the *Monitoria* and *Hyltonia*, much to their advantage as compared with plain ships of the same dimensions. Mr. Haver considers that "your readers, shipbuilders as well as shipowners, are mainly interested in the practical questions of construction of ships, economic working thereof, and financial results of their trading." Accordingly he brushes aside the question of the Caws tank *versus* the Froude tank system. "I think" (he says) "it is entirely out of place to say anything about that in your paper"; probably because he considers that the subject is beyond your readers.

There are certain points about the corrugated ship which must be conducive to economy and steadiness. If, because of the special type of construction, the registration societies have allowed the frame spacing to be made wider than in a plain ship of corresponding dimensions, there must be saving in weight of material. The corrugations will doubtless resist the rolling tendencies of the ships. The corrugations will allow of greater displacement for given dimensions and provide greater internal capacity. These admissions may be made without prejudice, and would justify some of the claims of Mr. Haver.

In the latest article written by Mr. Haver on "The Ideal Passenger Steamer" (which appeared in your contemporary the *Syren and Shipping* 1,000th number) he introduces a fairly lengthy description of the Caws tank and justifies its methods of experimenting. Was this description introduced to prove that the corrugated ship was lighter to build, was steadier in a seaway, could carry more cargo? Certainly not. It was the justification for the claim of "higher speed with reduced consumption, or a more reduced consumption with the same speed." Mr. Haver in his letter suggests that the very great success of the corrugated ship will shortly compel investigation by competent scientific authorities, to show why the Froude tank did not give the result equal to what the ships

did in actual working at sea, whereas the Caws tank did give the exact result. When these scientific authorities take up their task will they investigate the relative merits in a Froude's or Caws tank? It must either be in a Caws tank or in the open sea, for Froude's tank results have been proven (according to Mr. Haver) to be untrustworthy.

Experiments have, however, been made with full-sized ships on the open sea, and certain results have been given. I have seen in various papers some of these results, and if Mr. Haver is not personally responsible for the presentation of the facts, he should pray to be saved from his friends.

As long as Mr. Haver leaves out any claims as to extra speed and confines himself to the merits of lighter weight, greater steadiness and greater dead-weight capacity, his methods of construction are not so liable to be criticised. He would be well advised, in any future article which he may write advocating the adoption of the corrugated ship, to omit any reference to the Caws tank, for this is strongly inviting the kind of criticism to which he evidently objects, and which I think you, sir, were justified in making.

NAVAL ARCHITECT.

COALING SHIPS AT BALBOA.

The congestion in the delivery of coal to vessels at Balboa ensuing from the extraordinary demands caused by the closing of the Canal and the need of the ships to bunker at Balboa before leaving, has practically passed, says the *Canal Record*. On Saturday, October 30, the orders placed with the Balboa agency, beyond those then being filled, aggregated 8,800 tons. The agency has been supplying from 1,400 to 2,200 tons a day, and the indications are that all demands will have been met before now. During the month of October the coal furnished to ships at Balboa amounted to approximately 37,000 tons.

Under normal conditions before the closing of the Canal, nearly all of the bunkering was done at the Atlantic end of the Canal, at which the price is \$1 less per ton than at Balboa. Coaling at Balboa amounted to approximately 4,000 tons a month. The vessels which bunkered there were principally the Toyo Kisen Kaisha and other ships engaged in the Pacific coasting trade, with occasional demands from naval vessels and tramp steamers making Balboa for supplies while on the way between other Pacific ports; and once in a while a ship passing through the Canal would bunker at Balboa for the sake of quicker service than might be obtained at Cristobal at the time. Under such conditions, the facilities of the temporary coaling plant, supplying about 450 or 500 tons a day, were usually adequate.

Extending the facilities of the temporary plant to supply between 1,400 and 2,200 tons a day has been accomplished by hard work, long hours, and the use of means in which speed was held paramount and economy secondary. The force now engaged in the coaling work of the Balboa agency is about two-thirds of the entire force of the agency, which is approximately 700 men since the congestion. Two shifts are employed in coaling, working night and day. The time of each shift has been increased from 9 to 10 hours. Five coaling berths, not including the dolphins in the inner harbour, have been provided. Three of these are along the quay wall adjoining the port captain's office, and a special track has been laid along the deck of this wharf, in addition to the regular track along the face of the wharf, to expedite the handling of the locomotive cranes and of the coal cars without interference. To increase the output of the cranes at these berths the coal is dumped on the wharf, instead of being handled out of the wagons.

Two cranes are equipped with clamshell buckets, and handle direct from flat-bottomed wagons. Four lighters belonging to the Panama Railroad are in constant use for hauling coal to ships which moor at the dolphins in the inner harbour, and they are supplemented by the intermittent use of lighters belonging to the Pacific Steam Navigation Company, whenever they are available.

A 105-ton locomotive is especially assigned to switching the coal wagons. Four locomotive cranes have been put in service on the quay wall, in place of the one which before was borrowed from the Mechanical Division as needed.

The extensions noted have increased the cost of handling the coal, per ton, but the price of the coal has been kept the same. This is \$7 per ton at Balboa, trimmed in bunkers, when handled by the ship's gear; or if a locomotive crane is used for handling it, the price of \$7 per ton is increased by a charge of \$1 per hour for the use of the crane. The operation of the crane costs the railway company approximately \$2 an hour.

PORT OF LONDON TRADE.

The effect of the war on import and export trade at the Port of London Authority's docks is shown by official statistics for the six months ended September 30 last. During that period, although the tonnage of merchant shipping using the port showed a substantial decline, largely owing to the requisitioning of vessels on Government account and the withdrawal of enemy shipping from the high seas, the import goods handled in the Authority's warehouses totalled 1,472,060 tons, against 1,117,683 tons in the corresponding months of 1914, irrespective of the larger quantity of goods delivered direct by shipowners to wharves and other destinations.

It will be gathered from these returns that the vessels now reaching the Port of London are in nearly every case full ships. To some extent, no doubt, the increased arrivals of goods are due to the closure of such ports as Hamburg and Antwerp and to the consequent discontinuance of the system whereby a considerable quantity of shipping tonnage formerly reached London with part cargoes. It may be noted that of the increased imports dealt with by the Port of London Authority a very large quantity represents additional arrivals of wool, meat and other Australasian produce. The stock of goods in the warehouses of the Port Authority on September 30 last totalled 608,624 tons, an increase compared with the same date of 1914 of 28,504 tons.

The greater activity now characterising the export trade of the United Kingdom is shown by a growth of 55,923 tons in the quantity of export goods handled in the Port Authority's sheds during the half-year under review. The total was 424,727 tons.

A tender for the refrigerating machinery for the new cold store and sorting shed erected by the Port of London Authority at the Royal Albert Dock has recently been accepted. There is the promise therefore of an early addition to the Authority's cold storage accommodation to the extent, including the sorting shed, of half a million carcasses of mutton. This will carry the total storage capacity up to approximately a million and a half carcasses.

By means of covered mechanical conveyers, meat will be transferred rapidly and practically without handling from the refrigerated holds of ships into the upper storey of the big meat building at the water's edge. Here in a temperature of 15° F. the process of sorting will take place, the meat being subsequently taken by conveyers to the top storey of the huge cold store erected in the immediate rear. To this cold store there is access from the top storey only, the meat being distributed by lifts among the 20 separate cooled chambers and kept there in the same temperature as that of the sorting shed until it is brought up for delivery. A special building is to accommodate the refrigerating plant.

SIR FREDERICK GREEN'S GIFT.—A fresco, presented by Sir Frederick Green, was unveiled at the Royal Exchange last week. The subject was "Philip the Good presenting the Charter to the Merchant Adventurers." At Sir Frederick's request there was little ceremony. Sir Frederick Green was accompanied by his son, Mr. Devitt, and the artist. The inscription under the picture reads:—"Presented by Sir Frederick Green, Shipowner. Painted by A. E. Cox, R.B.A."

MISSING IRON-ORE CARRIERS.

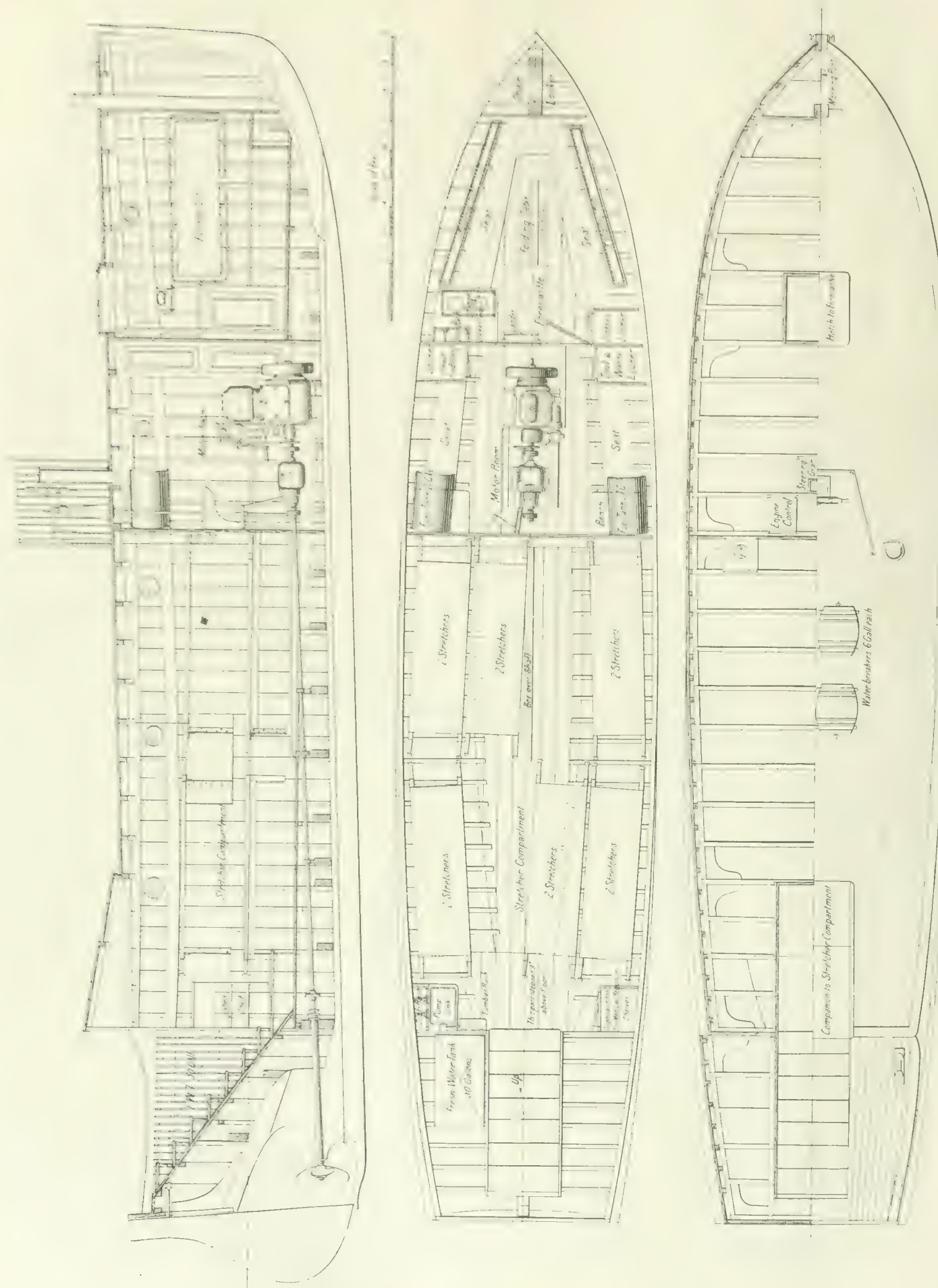
It is rather notable that two of the finest merchant vessels flying the flag of Sweden, and specially constructed for and engaged in the iron-ore industry, should end their all-too-short careers by being posted at Lloyd's as "missing." The two vessels referred to were the *Malmberget* and *Norrboten*. The former was finally posted "missing" on February 4, 1914, and the *Norrboten* was posted last week.

The outstanding points of interest in connection with these two losses are:—(1) Both ships hailed from Stockholm, and were owned by Rederi Aktiebolaget Lulea-Ofoten (P. A. Welin, Manager); (2) they were constructed by the same builders, R. & W. Hawthorn, Leslie & Co., on the Tyne, the *Malmberget* in 1913, and the *Norrboten* in 1912; (3) they were each equipped with wireless apparatus, and in regard to the loss of each the latest authentic news received by Lloyd's was a wireless message; (4) each disappeared when carrying a huge iron ore cargo—about 11,000 tons; (5) one, the *Malmberget*, was the largest vessel posted at Lloyd's as "missing" in 1914, and the other, the *Norrboten*, is the largest ship thus to be written off during the present year; and (6) in each case there was a heavy loss of life.

In regard to the *Norrboten*, it may be mentioned that she left Narvik (Norway) on September 12, bound for Philadelphia. Nothing definite is known of her later than September 23, on which date she was reported by wireless as 100 miles east of Cape Race. Under normal conditions she should have arrived at her destination on September 28. The opinion is that she was lost in the tempestuous weather which prevailed about that period off the North-American coast. She was commanded by a shipmaster named J. R. Lundmark, and carried a crew of between 40 and 50 hands. The missing steamer was in every sense of the word an up-to-date vessel, and was built with a cruiser stern. The *Norrboten* is, we believe, the first vessel with this special form of stern to be posted at Lloyd's as "missing." The vessel was of 8,011 gross tons, and 3,691 net tons, and had her machinery (402 nominal h.p.) placed aft.

In regard to the Scandinavian iron-ore trade, a few particulars of the design of the *Malmberget* may prove of interest. That vessel was constructed with four double, and four single ore pockets, or holds, on the self-discharging principle. On deck she had eight hydraulic cranes for handling the ore. The last, but uncompleted, voyage of the *Malmberget* was Narvik to Rotterdam. Wreckage from the ship seemed to indicate that she had met her fate in the gales which prevailed soon after she took her departure from the Norwegian ore port.

INTERNED SEAMEN.—The Imperial Merchant Service Guild have received the following message from Captain Allen, of the Ellerman liner *Assiout*, who is at present an interned prisoner in Turkey. Messages from the interned prisoners in Turkey are evidently still confined by the Turkish Censor to four lines—a matter which, on the representations of the Guild, the Foreign Office are now going into:—"October 30, 1915. We are all well and in the best of spirits, with the exception of Marshall and A. Hutton. The second lot of money we received a fortnight ago, for which we send our best thanks; it was greatly needed. A number of small parcels have been received here. Kind regards.—(Signed) ERNEST ALLEN." The Guild are also informed by a merchant captain released, owing to being an invalid, from the Ruhleben Camp, that the following articles of food are most appreciated by the prisoners:—Tinned butter, meats and fish, and tinned milk and jam. Biscuits, it is stated, are always required, as the supply of bread is very short and very bad. At the time this prisoner was released an endeavour was being made by the committee at the camp to establish a kitchen for cooking articles of food which might be received from this country, but nothing definite had then been done in this direction. The German military at the camp have been withdrawn, and the affairs are being run by the civilian committee of prisoners. Captain Woolner of the ss. *Coralie Horlock*, a member of the Guild, is now a vice-captain at the camp and occupies, with two others, a room formerly used by the military. He states that this room offers far better accommodation than he has had hitherto.



General Arrangement Drawing of Motor Ambulance Boat Built by the British Marine Motor Co., Whiteinch.

MOTOR AMBULANCE BOAT.

The British Marine Motor and Launch Company, Whiteinch, Glasgow, have just completed and despatched for service at the Dardanelles a high-class motor ambulance launch. The dimensions of the vessel are as follow :

Length	12 ft.
Breadth	9 ft.

The hull of the boat, which is handsomely modelled, is constructed of pitch pine, and the deck erections are of teak. The hospital room is situated amidships and provides accommodation for 12 stretcher cases. The room is entered by a companion-way leading from the quarter deck aft. The engine room is situated forward of amid-

SUPERHEATED STEAM IN MARINE PRACTICE.

A paper, entitled as above, was read by Mr. Henry B. Oatley at the 23rd General Meeting of the Society of Naval Architects and Marine Engineers, held in New York on November 18 and 19. The following is an abstract of this lengthy and important paper and it is possible that we may return to the subject in a later issue in order to deal with other portions of the paper which it is impossible to include in the present issue.

The present tendency with regard to superheating is to extend its application. This is true not only in marine practice, but also in locomotive and stationary engineering. It may be a matter of some surprise, to marine engineers generally, to note what is actually



Motor Ambulance Boat Built by the British Marine Motor and Launch Company, Whiteinch.

ships, while forward of that again are the crew's quarters, where sleeping accommodation is provided for two men.

The propelling machinery consists of a two-cylinder 18-22 b.h.p. Gleniffer paraffin engine, with petrol starting. The steering wheel is placed just forward of amidships, the steersman being protected by a light dodger. The engine controls are led to the steersman's hand, an arrangement which allows the vessel to be controlled by one man. The boat, which has been named *The Ardeer Factory*, will be the commodore vessel of a fleet of six, all of which are being completed on the Clyde.

SAN SALVADOR.—The Board of Trade have received through the Foreign Office, from His Majesty's Consul at San Salvador, the following translation of a notice which appeared in the official Government Journal of October 13 last :—"Those engaged in commerce, and the general public, are informed that by a decision of the Minister of Hacienda, and until further notice, no charges will be levied on any vessels which call at ports of the Republic of Salvador, either for port dues, lighthouse dues or fiscal dues, of any other class. All navigation companies—whether contracting with the Government or otherwise—will have the right to these privileges."

being accomplished with the higher degrees of superheat. The last decade has witnessed a wonderful advance in the adoption of high degrees of superheat on locomotives. About 40,000 locomotives throughout the world, of which more than 13,500 are in the United States and Canada, are to-day operating with temperatures in the steam chest above 600° Fahr. Some American railways are using 700 deg. temperature, while in France a large number of engines are operating daily and with wonderful success, at temperatures between 750° and 800° Fahr. Many of these locomotives operate at piston speeds of 1,500 ft. per min. That these locomotives are not small engines is proved by the daily operation on several different railways of engines in both passenger and freight service which have shown above 3,000 i.h.p. We must not feel, therefore, that the temperatures used on locomotives are in combination with small engines for the modern locomotive in the United States has practically the same indicated horse power as the average cargo boat. In stationary practice the adoption of superheat has been very rapid, and a large number of plants in the United States are now in operation using at least 150 deg. of superheat. In marine practice during the last 15 years, over 1,200 ships have been fitted with superheaters, all

using 100 deg. of superheat, and the necessity of vessels operating with practically 200 deg. of superheat. It is not exaggerated to state that at the present time well over 2,000 steamers are almost using superheated steam, the majority of which are operating with what we have called "high superheat." In reality the adoption of superheated steam is world wide and is permeating nearly all branches of steam engineering.

Cylinder ratios to be suitable for use with highly superheated steam require consideration on account of the steam characteristics. The published dimensions of British and German superheated steamships show that a lower cylinder ratio is used. This is generally compensated by increasing the diameter of the high pressure cylinder, the intermediate and the low pressure diameters, on a triple engine, remaining as before. In quadruple engines, the high and first intermediate pressure cylinders are increased in diameter,

that a 10 per cent. greater volume of steam, which weighs about 30 per cent. less per unit of volume than saturated steam, is used. These figures will indicate that there is still a considerable margin for steam economy, although a greater volume of steam per stroke is taken.

Lubrication is probably the most prominent point in mind when first considering the use of superheated steam. In reality this need not cause apprehension. With low degrees of superheat, it is not always necessary to use any oil internally. This may be explained by the fact that the superheat is not sufficient to carry the steam through the high pressure cylinder without condensation. Where condensation occurs oil lubrication may not be necessary, and this is particularly true when low pressures are carried. Low superheat really does little more than eliminate part of the initial condensation. With moderate degrees of superheat opinions differ as to the necessity



P. & O. Liner "Socotra," ashore and broken in two off Paris Plage, North Coast of France.

while no change is made in the second intermediate and low pressure cylinders. In converting saturated engines to the use of superheated steam an increase in the high pressure cylinder diameter is not always advisable, and many times not possible. In such cases, if the indicated horse power is to be obtained, it is necessary to increase the cut off in the high pressure cylinder, thus giving an increased volume of steam at cut off, and, in effect, decreasing the cylinder ratio. If the volume at cut off is not increased the indicated horsepower will be slightly decreased, assuming, of course, that the boiler pressure is not changed. To explain the necessity for these modifications it will only be necessary to point out that the expansion curve of superheated steam falls a little more rapidly than saturated steam and, to make up for this, the volume of steam at cut off, with, say, 200 deg. of superheat, should be about 10 per cent. greater than the volume with saturated steam in order to get equal power. This does not mean, of course, that the same weight of steam is used per stroke after superheating. It merely means

for the use of oil. Cases are on record where superheat of more than 100 deg. has been successfully used without internal oil lubrication. It seems probable, however, that in such cases heavy swabbing of rods was resorted to. When high degrees of superheat are considered, lubricating oil should certainly be applied internally. The quantity of oil needed to satisfactorily provide for 150 or more degrees of superheat is probably imagined as being greater than what is actually required. The average of a large number of boats using high degrees of superheat shows that very favourable results were obtained with about 0.3 gall. of oil per 1,000 h.p. per 24 hours. One case has been reported of a 2,800 h.p. ship that used but 20.5 gall. of oil on a 42-day voyage. This is just about 0.5 gall. per day, or 0.167 gall. per 1,000 h.p. per 24 hours. Mr. Gray, in his paper before the Institution of Naval Architects, speaking of the lubrication required, says:—

"On the *Port Augusta*, of 2,000 i.h.p., 1.5 gall. per day of cylinder oil were used at first for internal lubricating and swabbing of piston

rods of both main and auxiliary engines; on the *Port Lincoln* and *Port Macquarie*, of 4,000 i.h.p., about 2 gall. per day, this being gradually reduced until now only 0.5 to 0.75 gall. is required."

The keynote of the lubrication question with highly superheated steam is that a regular supply rather than a large quantity of oil is required. The oil furnishes the lubrication previously afforded by the water present in the saturated steam, but it does not follow that a regular supply of oil means a large quantity of oil.

An oil pump, driven from some convenient part of the engine, is required to feed oil in a steady and regular manner. Inexpensive pumps are on the market, and are reported as being reliable in service. Many of them are so arranged that the oil container is not under pressure, thus permitting a renewal of the oil supply without trouble or danger. In modern practice, the oil is introduced into the steam pipe between the throttle valve and the engine. The delivery end of the oil pipe fitting extends into the steam pipe, so that the current of steam entrains the oil and it is atomised before reaching the wearing parts. This feature has been found very important.

Filters are, of course, necessary where there is any possibility of oil being taken into the boilers. A large proportion of steamers using saturated steam in condensing engines are at present equipped with filters. It is believed that in a good many ships the filtering apparatus now installed, particularly with proper attention given to cleaning, is adequate to prevent oil reaching the boilers. A number of recently built ships, using high superheat, have had two filters arranged in series, and reports from engineers on such boats indicate that oil does not get into the boilers so as to cause any damage or give trouble. No matter how good filters may be, they will not keep oil out of the boilers unless attended to. With a double filter installation, the first filter is generally inspected and cleaned about every two days while at sea. The second filter does not require attention oftener than about once a week.

Pyrometers are desirable for measuring the temperature of the steam at various points. It appears, at the present time, common practice to have one pyrometer indicating the temperature of steam at the engine stop valve, also to have other pyrometers at points nearer the superheater for indicating the temperature of the steam where it leaves the superheating apparatus. A pyrometer to register the temperature of steam in the intermediate pressure chest is also frequently applied. Various types of pyrometers which measure these temperatures accurately are available and are reliable instruments; the electric pyrometer, especially, appears to have been developed in a satisfactory manner for marine practice. The information given by the pyrometer is important, and makes it possible to determine:—

1. How far superheat is being carried through the engine.
2. Whether any boiler is being properly or improperly fired.
3. By showing a reduction in steam temperature, gives warning of an impending fall in boiler pressure; in other words, acts as a danger signal as regards pressures.

FRANCE AND HIGH SHIP FREIGHTS. A Central News message states that a Bill is to be introduced in France to attempt to remedy the evil of existing high ship freights by taking action to acquire a commercial fleet of 50 vessels. The proposal was initiated by M. Sembat as the result of representations made to Great Britain by high Government officials concerning the purchase of a large stock of coal to constitute a reserve supply. Originally it was proposed to establish a commercial fleet of 100 steamers, aggregating more than 500,000 tons, to be acquired in England through the agency of a London firm of maritime brokers, with whom the French Government was to have signed a special agreement. The first negotiations, however, fell through on account of the conditions imposed by the brokers. The negotiations were resumed after the reconstitution of the French Cabinet, but on the basis of a fleet of 50 instead of 100 vessels. The Government Bill proposes the acquisition of an unspecified number of cold storage vessels for the transportation of food, and a number of tank steamers for petrol. The Bill will be submitted almost at once to Committees of the Chamber and Senate.

PROPELLER SHAFTS: HOW TO PRESERVE AND HOW TO PROTECT THEM.*

Engineers have tried various methods of preventing corrosion to the propeller shafts of steamers, as well as of reducing the friction in the stern tubes. Water, as is well known, is not a lubricant; and yet, strange to say, 70 per cent. of the steamers running depend on water for the lubrication of their stern bushes and propeller shafts. No engineer would lubricate his engine with sea water, and yet the most important bearing in the ship is usually lubricated with it.

If a suitable lubricant can be employed in the stern tube it stands to reason that the friction would be greatly reduced. Careful experiments conducted by a prominent marine engine builder have clearly proved this. He has ascertained that with a shaft having a brass liner running in a lignum-vitæ bush and lubricated with sea water, the coefficient of friction is 0.094, whereas with a steel shaft running in white metal and lubricated with oil, the coefficient of friction is 0.048.

Some engineers have tried tallow or solidified oil in the stern tubes. These are not desirable for several reasons. Tallow sometimes contains mineral acids and usually also an appreciable percentage of free fatty acid; it also has a tendency to turn rancid and to generate still more fatty acid. These acids tend to corrode the shaft and to perpetuate the galvanic corrosion which is caused by sea water. Another objection to tallow and to all solid lubricants is that any particles of sand which enter the stern bush are kept up against the shaft and act like a file upon it. Any oil used in a stern tube should be non-corrosive, not only free from mineral acid but free from fatty acid; it should also be a semi-solid or non-fluid oil, for a thin oil has a much greater tendency to work out of the stern tube and be lost. The difficulty is to find a non-corrosive oil which is really a good lubricant and yet free from fatty acid.

Hydrocarbon oils, such as vaseline, are free from fatty acid, but they have not the "oiliness" or high lubricating power which is essential for a large bearing like the stern bush. The corrosion which takes place in the stern tube is usually the result of galvanic action, just the same as the corrosion between the two metals in the battery of an electric bell. Also in selecting a lubricant for this purpose it is advisable to choose a non-corrosive lubricant with the peculiar power of adherence to metal surfaces, so that once on the tail shaft it would be practically impossible for water to wash it off; also one that has a very strong lathering power, that is, it should make when mixed with water a flat or velvety lather (not a frothy one) of a very rich nature. Shafts which have been lubricated with this class of oil for many years are not showing the least sign of corrosion or rust.

There are various methods of applying the oil to the tail shafts. Some engineers force it into the stern tubes and allow it to find its way out through the bush. Others simply feed the oil by gravitation; sometimes both these methods answer, but usually, sooner or later, they are found to work unsatisfactorily. Also both these methods are far from economical.

The author then described stern tube appliances which are in vogue for retaining the oil in the stern tubes and preventing the entry of sand and grit into the stern bushes, as from experience of these, engineers, who have made it a point of lubricating the propeller shafts of their steamers, have found that it is a costly item on account of the oil running out of the tubes, a great part of it being wasted; but if they adopt a stern tube appliance or patent gland which is fitted at the after-end of the tube, this waste can be avoided and at the same time the sand and grit are excluded from the stern bush.

There are several patent stern tube appliances on the market, and they differ very little from each other in the principle, and are all more or less efficient. One of the best-known and simplest

* Abstract of a paper read by Mr. A. J. Lebeda at the Institute of Marine Engineers on December 7.

appliance in use is the Vickers' patent tail shaft appliance. This fitting is composed of two or more glands fixed at the after end of the stern bush, the glands containing one or more specially made floating packing rings, which are so fitted to the shaft that they prevent any leakage of oil and also prevent any water from entering the tube. In the after-gland two elastic washers are fitted which act as brushes and brush away all sand and grit which is likely to enter into the stern bush and score the shaft, and in some cases cause a great amount of damage. This fitting, as herewith shown, is extremely simple and can be fitted to almost any vessel providing there is at least a space of 2 in. between the propeller boss and the end of the stern bush. The appliance works equally well with a plain shaft or with a shaft with liners and with any kind of bush, lignum-vitæ, white metal, or plain cast iron.

Vessels which have this type of appliance have been able to have their stern glands at the forward end of the tubes repacked while the ship was floating, and the fittings were so tight that not a drop of water has entered the tubes. This goes to show that although the appliance in itself is of simple construction, it is, at the same time, efficient. The writer has had the opportunity of inspecting the shafts of two twin screw vessels which were fitted with this appliance in 1901, and after

11 years' service the shafts were perfectly bright, and free from corrosion, and the white metal bushes had only worn down $\frac{1}{16}$ in. from the total diameter. These are two ordinary passenger steamers, running

at about 16 knots speed, and similar results have been obtained on a number of others. This type of stern tube appliance is working satisfactorily on turbine steamers where the revolutions of the shafts are 700 per min., and although this is a very high speed, the highest average temperature obtained in the tubes has only been 140 Fahr. A thing which is very noticeable on vessels thus fitted is the almost entire absence of vibration at the after-end of the vessel. This in itself is a great advantage, especially in high-speed passenger steamers where sleeping accommodation is at the after-end of the vessel. This type of fitting has also found great favour amongst the owners of dredgers and hoppers. As these vessels are continually working in water fully charged with sand, it is very often a costly item to keep the bushes and shafts in good condition on account of the sand and grit wearing them away in a very short time. Another feature also is that the special floating packing rings last a considerable time and very seldom require renewing. The only parts that are subject to excessive wear are the elastic washers, and as these are not a costly item, very little is spent on upkeep.

There are one or two other very good appliances also on the market. The majority of them contain springs and depend on the efficiency of these to keep the appliances up against the face of the stern bush, and also to keep the box tight. There have been some very good results obtained also with these appliances, and some steamers have been running for a period of about 15 or 16 years without renewing either tail shafts or bushes. There is no doubt that in the near future there will be hardly any steamer of note which will not have the propeller shaft lubricated and protected by some means, as if this is done in a proper manner the dry-docking expenses and the time saved is very often considerable, and the cost of fitting the vessel in this manner is often repaid within 12 months.

INSTITUTE OF SHIPBROKERS.—The annual meeting will be held on Tuesday, December 21, at 3 p.m., in the Merchants' Hall, Baltic Exchange.

STEAMSHIP APPLIANCES.

LIMEWASHING AND SPRAYING MACHINES.

The problem of properly cleansing ships holds and also for keeping sweet some of the less ventilated of those portions of a vessel which are always more or less habitable depends sometimes upon limewashing or the proper application of disinfecting solutions, and this in its turn devolves upon some efficient appliance for applying the solution. Ordinary hand brushing involves considerable labour and as there are machines which do the work more effectually with less manual effort it naturally follows that these machines should be considered.

The Stonehouse Works Company, Spon Lane Mills, Houghton Street, West Bromwich, Staffs, have devoted special attention to these appliances and in consequence have evolved special types

for different requirements. These deliver the solution in the form of a fine spray which has considerable driving force to assure the limewash or disinfecting fluid going into all crevices and awkward bends—an operation which hand brush work does not perform satisfactorily. The types which are probably most suitable for ship work are the Rajah, President and Czar patterns. These are all portable and worked by hand. The workmanship is thorough and the machines are strong enough to withstand the rough usage apparatus generally receives on board. The three types mentioned have capacities of six gallons each and there are



Czar Pattern Spraying Machine.

6 ft. of hose. The nozzles are of a special pattern which prevents the solution choking them. This is a feature which will be particularly appreciated by those who have had much to do with spraying devices. There are also heavier and more elaborate machines made fulfilling practically every variety of purpose.

Although we have singled out work on ship board it is obvious that in shipbuilding, marine engineering and kindred establishments this form of apparatus could be employed to advantage.

THE LUMBER EXPORTERS' LINE.—Representatives of 11 lumber exporting firms, aggregating £1,000,000 capital, met at Memphis, Tenn., recently, and organised a company to charter steamships to carry Southern hardwoods from gulf ports to Europe. The company has a capital stock of £20,000, fully subscribed, and will operate under the name of the Lumber Exporters' Line. The first sailing of a chartered vessel will be made early this month, and thereafter sailings will be made regularly, two or three times a month. Harry Piaggio, of Gulfport, Miss., a large exporter to Italy, who is one of the prime movers in the new ventures, has options on several large ocean steamships which he expects to close immediately. The company's home ports will be Mobile and Gulfport. It is planned to utilise 60 per cent. of the space on each ship for transportation of lumber. The remaining 40 per cent. will be sold for transportation of heavier products. The lumber firms financially interested in the company will have first call for space on the chartered ships. Nine Memphis lumber firms are charter members of the Lumber Exporters' Line. Other incorporators are: Harry Piaggio, of Gulfport, Miss.; W. T. Stewart, Vice-President and General Manager of the Gulf and Ship Island Railroad; J. W. Summerville, of Gulfport and Mobile, of Hunter-Benn & Co.; and A. L. Staples, Vice-President of the Bank of Mobile. A committee composed of Mr. Piaggio, Mr. Summerville, Mr. Stewart, W. H. Russe and Rudolph Sondheimer, was appointed to draw up the company's charter and to arrange other details.

GENERAL NEWS SECTION.

PERSONAL.

The death of Dr. Robert Caird has removed from the Clyde district a leading shipbuilder and engineer, and a citizen eminent in many walks of life. In business he took a leading share in raising the firm of Caird & Co., which was founded by his father, to the position which it occupies to-day. Dr. Caird, who was in his 64th year, was the son of the late Mr. James Tennant Caird. He received his early education in Greenock, and he afterwards studied at the University of Glasgow. On completing his education he did not immediately become associated with the shipbuilding business, but spent some time abroad, first in Italy and then in the United States. In the latter country he was for a time in the employment of the Pullman Car Company, where he got an insight into American business methods. Mr. Caird returned to Greenock shortly before his father's death in 1888, and joined the firm of Caird & Co. He soon became a director of the concern, and latterly he was appointed

scientific head of the engineering department, a position for which his training at home and abroad had specially fitted him. From that time his main energies were devoted to the advancement of marine engineering and naval architecture, and his success in these directions is reflected in the high esteem in which he was held by other workers in the same field. To the literature of naval architecture and engineering he made numerous contributions by papers read before scientific and technical societies and by other means. He became President of the Institution of Engineers and Shipbuilders in Scotland in 1900, and he was made a Fellow of the Royal Society of Edinburgh.

In 1910 he delivered the Watt Lecture in Greenock, taking as his subject "James Watt's Contribution to the Advancement of Engineering." He also took a prominent part in the movement for the founding of Greenock Watt Memorial School. In 1900 the University of Glasgow bestowed on him the honorary degree of Doctor of Laws. In the course of his several years' residence abroad Dr. Caird acquired an extensive knowledge of the languages and literature of France, Italy and Germany, and while in Italy he carried out certain historical and art investigations under the direction of John Ruskin. His knowledge of Italy and Italian literature was very extensive, and in 1895 he had conferred upon him the Order of the Knights of the Cross of Italy. His ripe scholarship and his marked literary, scientific and artistic attainments made him an attractive personality, and his many friends throughout the country will learn of his death with great regret. Dr. Caird is survived by his wife and one daughter.

The funeral took place on Monday this week at Birkdale, Southport, of Mr. Harry Balls Roper, Chairman and Managing Director of the Leyland Line. The deceased gentleman was at business as usual as recently as Wednesday of last week, but on reaching home in the evening he was seized with a serious illness and died early the next morning. The late Mr. Roper was 57 years of age, and had

been associated with shipping all his life. Early in his career he was manager in London for Thomas Wilson, Sons & Co., and later became General Manager and Secretary of the Wilson & Furness Leyland Line. In 1906, on the retirement of Mr. Henry Wilding, Mr. Roper succeeded him as chairman and managing director of the Leyland Line. During his direction of the company in the intervening years the Leyland Company has been brought out of financial stress to its former sound position as a dividend-paying concern. Furthermore the fleet has been practically remodelled with vessels of the most up-to-date character. Mr. Roper was greatly esteemed as a business man, and otherwise held in the highest respect by all who knew him.

The death has occurred at Barrow-in-Furness of Mr. James Fisher, of James Fisher & Sons, Barrow, owners of a large number of coasting steamers and sailing ships.

Gunner Wm. Jennings, Royal Field Artillery, has been awarded the French Croix de Guerre and the Russian Medal of St. George for gallantry in France. He was an employee of Workman, Clark & Co., Ltd.

Mr. J. T. Callaghan, Chairman of L. Gueret, Ltd., coal exporters, Cardiff, was last week elected President of the South Wales and Monmouthshire Coal Freighters' Association in succession to Mr. John Andrews, of the Albion Coal Company.

Mr. R. S. Rowell, whose sudden death is announced, was for many years associated with Elliott Lowrey & Dunford, Newcastle. Of late years he was in business on his own account at the Quayside Newcastle, and also represented R. & W. Hawthorn, Leslie & Co., Ltd.

Captain Jenkins, of the Prince liner *Japanese Prince*, has been awarded by the owners £500 and a like amount has been divided among the crew for their plucky encounter with a German submarine, during which they were shelled for five hours and a half.

Following a meeting of interested parties on Monday the Middlesbrough Shipbrokers' Association has been formed. Mr. B. O. Davies, of John M. Lennard & Sons, Ltd., has been elected President, and Mr. J. W. Brown, of Hanson, Brown & Co., Ltd., Honorary Secretary.

By the death of M. Adolphe Greiner the Iron and Steel Institute loses a president and shipbuilding one of its leaders. M. Greiner was Managing Director of the Belgian concern of John Cockerill, of Seraing, whose shipbuilding, engineering and steel manufactures are well known.

The appointment of Mr. William George Morgan as General Shipyard Manager of the Northumberland Shipbuilding Company, Ltd., Howdon-on-Tyne, has aroused popular interest on account of that gentleman's connection with the Antwerp Engineering Company at Hoboken, of which he was Manager until the German occupation.

His Majesty the King has been pleased, on the recommendation of the President of the Board of Trade, to award the silver medal for gallantry in saving life at sea to Mr. Thomas Alexander, second officer of the steamship *Stanislas*, of Liverpool, in recognition of his services in attempting to rescue a seaman of that vessel who was knocked overboard in the English Channel on November 1.

Mr. W. H. Rogers, staith-master for the Cardiff Railway Company, intends retiring at the close of the present year. Mr. Rogers, who is 65 years of age, has been at the Cardiff Docks 54 years, and entered the employ of the Bute Company 52½ years ago. In 1874 he became a sociated with the coal shipping section of the Cardiff Railway Company, and since 1882 has had sole charge of this department.



Photo

[Lafayette]

The late Dr. Robert Caird.

The Admiralty committee for the Mersey district, which is charged with the selection of the best men for the district, were reported on Monday this week, and it is as follows:—A. F. Sylvester, E. C. Bowring, Vice-Presidents; H. A. Dale, H. D. Ratcliffe, and W. H. Jones, Members. It is interesting to find that on the Committee's registration connected with shipping—namely, Mr. E. C. Bowring. In regard to the recruiting tribunal itself, Sir Norman Hill has been urging on the staff of the Liverpool Steamship Owners' Association that with respect to the clerical staffs in the shipping and other offices their employment to the best advantage of the nation can be best determined by men having a wide and intimate knowledge of the problems with which shipowners are confronted.

Captain George A. Dearborn, 92 years old, has died from old age at his residence in Gardiner, Me., where he had lived for the past 22 years. Captain Dearborn was born in Pittston, Me., and was for many years master captain of sailing ships plying between New York, Liverpool and Antwerp. He was in command successively of the ships *Lea Wins*, *Henry Lee*, *S. S. General*, *Henry P. Whitney* and *Yonkers*, and later of the steamship *Lea*, running between New York City and Savannah, Ga., and of the steamship *New Orleans*, from New York City to New Orleans. Captain Dearborn was a prominent member of the Marine Society of New York. He is survived by a daughter, Mrs. S. P. Bradstreet, of Gardiner, Me.; a son, George A. Dearborn, living in Brooklyn; and a brother, D. B. Dearborn, 83 years old, still active in the shipping business in New York City. Ten years ago, and until his retirement, Captain Dearborn was a dockmaster in New York.

FROM OUR CORRESPONDENTS.

CLYDE AND DISTRICT.

(FROM OUR OWN CORRESPONDENT.)

Glasgow.

The statements which have recently been made to the effect that the output of Government work from the shipyards of the country shows signs of falling off are said to be not altogether correct. There is still considerable pressure for the delivery of Government work on hand, but what is actually happening is that shipbuilders are being permitted to complete certain vessels which were laid down, either before or since the war broke out, for private owners. Quite a number of vessels are still on the stocks in the Clyde district, which were laid down prior to the outbreak of hostilities, and if these can be completed without unduly delaying national work, the vessels could, of course, be very usefully employed at the present time.

DEEPENING THE CLYDE.

About two years ago the Clyde Lighthouses Trustees commenced to deepen the part of the navigable channel of the Clyde under their control, and for this purpose they had a dredger and two barges built. At a meeting of the Trust held last week Mr. Francis Henderson, who presided, stated that the work which the Trustees had undertaken had now been practically completed, and the lower reaches of the river, which are under the control of the Lighthouses Trust, are on an average from 1 to 2 ft. deeper than the part of the river controlled by the Clyde Navigation Trust. This, of course, is as it should be, but till the upper reaches have been deepened further it would be unnecessary for the Lighthouses Trust to proceed with the dredging of their portion of the river. The Trustees are in possession of a high-class dredger and two barges, which were specially built for the work, and they are now finding employment for this plant in hiring it out to shipbuilders or others who have dredging to do in connection with their shipyards or berthing basins.

A NEW HARRISON LINER.

The fitting-out of the new Harrison liner *Barrister* has now been completed, and after the vessel's trial runs she sails for Cape Town in the joint service of the Ellerman and Harrison Lines. It has also been announced that she takes cargo for Luderitz Bay and Swakopmund in what was formerly German territory. The *Barrister*, which is a vessel of 3,800 tons, has been built by Charles Connell & Co., Scotstoun, while the machinery was supplied by Dunsmuir & Jackson, Govan. Another new steamer for the same owners—the *Governor*—was recently completed on the Clyde by D. & W. Henderson, Meadowside.

PROPOSED CANTEENS AT THE DOCKS.

The proposal to establish canteens at Glasgow Harbour has now taken definite shape and a conference was held in Glasgow on Monday between members of Central Board of Control (Liquor Traffic) and representatives of the shipowners of Glasgow, and of the Scottish Union of Dock Labourers. Colonel Denny and Sir George Newman were present as representing the Control Board. A good many of the shipowners, as well as the workmen, are in favour of the establishment of canteens. There is no doubt that at present the work of loading and discharging of vessels at the harbour is being delayed owing to the action of the majority of the dock labourers. Under the restrictions placed on the sale of intoxicating liquors since the war began the public houses in Glasgow do not open till noon, but at that hour there is a general exodus of workers from the docks to the public houses in the vicinity, and until they return work is practically suspended. A further conference will be held before a final decision is come to with regard to the proposed establishment of canteens.

THE NORTH-EAST COAST.

(FROM OUR OWN CORRESPONDENT.)

Newcastle-on-Tyne.

During the last month 8 vessels were launched from the Tyne yards, which is precisely the same number as was launched in the corresponding month of last year. For the first 11 months of this year 83 vessels have been launched on the Tyne as compared with 76 launched during the first 11 months of 1914. The output from the Wear for the past month consisted of only one vessel, the ss. *Uskmouth*, building by J. Priestman & Co., for R. W. Jones & Co., of Newport (Mon.), which is 320 ft. by 40 ft. 9 in. by 20 ft. 9 in. and of 2,300 gross tonnage. For the first 11 months of the year 30 vessels of 101,439 tons were launched on the Wear, as compared with 66 vessels of 257,145 tons launched up to November 30 last year. It will, of course, be fully recognised that these figures give no correct indication of the volume of work which has been in hand during the current year, and no figures are, naturally, available of the immense amount of naval work completed and now in hand. In normal times, little naval work is done on Wearside, whereas during the past 15 months this river has contributed no small share to the national interests. Builders would welcome the opportunity of reverting to purely commercial tonnage, but the position is complicated by any number of difficulties. So soon as any particular naval work is completed, the skilled hands rather resent turning to commercial tonnage, as the rates for Admiralty work are based on a higher scale. Then the rates of shipbuilding material have recently been further advanced, steel ship plates and steel ship angles are up no less than £1 per ton. The existing quotations are:—Iron ship plates, £10; iron ship angles, £12; iron ship rivets, £13 10s.; steel ship plates, £11; and steel ship angles, £10 15s. Of the few inquiries which have lately been in circulation, it is understood that an order has been placed at West Hartlepool for two fairly large tramp steamers for British owners, whilst two cargo steamers of medium size have also been ordered from Wearside.

MOTOR MACHINERY IN SAILING VESSELS.

Some interesting work in installing motor machinery in sailing vessels has just recently been completed, whilst other work is also now in hand by Wm. Hill, Ltd., of South Shields. The German prize, three-masted schooner, *Theodor*, 189 ft. by 31 ft. 6 in. by 15 ft., built at Kassel-on-Rhine in 1911, has been fitted with a Bolinder's 80 b.h.p. direct reversible crude oil motor, burning approximately 5 gall. per hour, and giving the ship a service speed of 5 knots. After having been in Hepple & Co.'s dry dock to allow of the fixing of the shafting, the ship sailed on December 6 for Seaham Harbour, to enter the coastal trade of her new owners, Arthur Tait, Ltd., Newcastle-on-Tyne. For the same owners, there is also in hand at South Shields, the sailing vessel *Bethlehem*, 360 tons, built in 1896 by J. Rasuke, of Gutmansbach, for Riga owners, and which is being fitted with a Bolinder's motor of 120 b.h.p., burning about 7½ gallons per hour. The *Bethlehem* is to be re-classified and will be ready for service in January. Arthur Tait, Ltd., have also lately purchased the sailing barge *Enterprise*, built at Yarmouth in 1891 and owned by Bessey & Palmer, of that port. The *Bethlehem* is to be provided with a twin-screw Kromhout engines, each of 45 b.h.p.

SHIP REPAIRING.

There has been no great pressure at the graving docks during the past 10 days, but the stormy weather of last week will add

somewhat to the volume of work shortly available, as several vessels went ashore locally during the past few days, and some will undoubtedly have sustained damage. Recent arrivals include the ss. *Madura*, owned by Maclay & McIntyre, of Glasgow, which, with a full timber cargo for West Hartlepool, went ashore and was badly damaged in the White Sea. The vessel is now in Brigham & Cowan's dock, South Shields, where alongside is the ss. *Spart*. The Wallsend Slipway & Engineering Company have still in hand the large oil tanker *San Eduardo* and the ss. *Union*, built at Renfrew in 1879 and now owned by the Forenede Dampskibs-Selskas, Ltd., of Copenhagen. At Wallsend, Swan, Hunter & Wigham Richardson, Ltd., are engaged upon the conversion to a molasses-carrier of the Liverpool-owned steamer *Delmira* and the ss. *Colemere*, owned by H. Watson & Co., of Manchester, which, when laden with a cargo of cotton seed, took fire in the Mediterranean and sustained serious damage. At South Shields, Smith's Dock Company, Ltd., are completing the repairs to the East Asiatic Company's steamer *Samui*, and their recent arrivals include the ss. *Blammanden*, of Bergen, which went ashore and sustained damage on the Yorkshire coast. They have just undocked the ss. *Gleneden*, of Glasgow, and are expecting to receive this week the ss. *Egyptian Prince*, of the Prince Line, Ltd., which has sustained stem damage in collision. Other work in hand at these docks are the Ropner liner *Salmonpool* and the Glasgow steamer *Doonholme*. At their establishment at South Bank-on-Tees, Smith's Dock Company, Ltd., have in for bow repairs the oil-tanker *San Nazario* and the Royal Mail steamer *Rudnorshire* for collision repairs.

SOUTH WALES NOTES.

(FROM OUR OWN CORRESPONDENT.)

Cardiff.

An unforeseen hitch has arisen with regard to the Swansea Harbour Trust's negotiations with the Swansea Corporation with reference to the financing of the harbour authorities by the Corporation under an agreement mutually arrived at on the completion of the King's Dock in 1909. The Corporation before they advance the £150,000 asked for are pressing for better representation on the Harbour Trust, and contend that some of the interests at present represented are obsolete, such as the four representatives of the Duke of Beaufort and one of the Earl of Jersey. It is suggested that the Harbour Trust should secure powers by Act of Parliament to substitute for these representatives of the ratepayers. The sub-committee of the Harbour Trust appointed to go into the matter intimate that they are unable to recommend the acceptance of the proposals made to them on behalf of the corporation, and in view of this attitude the Corporation Committee have, at any rate for the time being, refused to go further into the question, and last week cancelled a meeting convened for the purpose of considering the Swansea Harbour Bill, 1916, which would give the Corporation, if passed, powers to raise the monies required by the Trust.

SHIP REPAIRING.

Active conditions continue in evidence in the Welsh ship-repairing industry, and repairers at present are making strenuous efforts to get as many vessels completed as possible before Christmas. The difficulty of securing sufficient labour to cope with requirements remains a source of anxiety to the masters. Several big "jobs" are in hand and others are expected, so that it is probable that work will be brisk for some time. The Bute Shipbuilding & Engineering Co., Ltd., are carrying out general repairs to Scaramanga Bros.' steamer *Leander*, while the Cardiff Channel Dry Docks & Pontoon Company, Ltd., are busy with a general overhaul of the Middlesbrough steamer *Lockwood* and the Danish steamer *Bogatyr*. T. Diamond & Co. are putting the London steamer *Reynolds* through her survey, and the Cardiff Junction Dry Dock & Engineering Company are renewing a large number of plates on the Whitby steamer *Carisbrook*. The Mercantile Pontoon Company, Ltd., have a big bottom job on the Newcastle steamer *Pontop*, about 70 plates having to be straightened or renewed. Hills' Dry Docks & Engineering Co. are effecting general repairs to the Norwegian steamer *Njaal* and the French steamers *Arez* and *Le Scorf*. The Mountstuart Dry Docks, Ltd., have just commenced repairs, which it is estimated will take until the end of January next, on the London steamer *Nigretia*, and are also overhauling the French steamer *Aster*. Elliot & Jeffery, Ltd., have their Windsor slipways fully occupied with general repair work on the Bristol steamer *Ino*, the Norwegian steamer *Garibaldi* and the Hull steamer *Deddington*. C. H. Bailey are exceptionally busy at Barry and Newport with

repairs to 23 steamers, including the *Daybreak*, *Constantine*, *Arammore*, *Norlands*, *Rask*, *Capenor*, *Gemma*, *Mercia*, *Poldennis*, *Glenroy*, *Uranium*, *Azul*, *Benha*, *Glenmorag*, *Cortes*, *Neuquen*, *Inverberrie*, *Le Blavet*, *Eolo*, *Oakmere*, *Mabel Baird*, *Cape Breton* and *Bendew*. The Barry Graving Dock & Engineering Co. have a good bow job on the St. Ives steamer *Trevilly*, which stove in her bows by colliding with the quay wall on entering the Barry Docks. A new stem will be needed, besides a number of floors, plates and frames. The French steamer *Carol Ier* has also had her rudder lifted and general repairs executed, and the West Hartlepool steamer *Hartlepool* has had her boiler lifted, overhauled and retubed, besides minor repairs. A comparatively large number of vessels are also in the hands of Newport and Swansea repairers.

MERSEY SHIPPING AND SHIPBUILDING.

(FROM OUR OWN CORRESPONDENT.)

Liverpool.

A decision of some importance to shipyard employers was given at the sitting of the local Munitions Tribunal on Saturday anent the direction of the Ministry of Munitions that a certificate of discharge ought not to be refused to a workman unless fully employed on munition work. In my last letter I remarked that this new rule, if followed literally, would be made the excuse for men engaged in ship-repair work to apply for a leaving certificate if they were temporarily put on a purely mercantile job. Two such applications were indeed made on Saturday, and in respect of one of them the important ruling was made that the firm in question was employed on very important Government work, and it was necessary for them to keep a nucleus of men employed so that they could be immediately drafted on munition work as it came in. The broad view here taken by the Court of a problem that was giving cause for anxiety has relieved the position of employers considerably, in whose yards and workshops the amount of munitions work varies so much from day to day.

Shipping shares are still on the up grade on the Liverpool Stock Exchange. Cunards were on Monday this week listed at 71s. 9d. per £1 share, an advance of 43s. 3d. since the war broke out. Furness Withy shares, which have also been active recently, varied from 34s. 9d. to 35s.

Coal prices have further hardened during the past week, with short supplies being experienced. At the Liverpool docks Lancashire qualities are now fetching 20s. to 21s., and Yorkshire hards 24s. to 25s.

THE "DALDORCH."

In the successful salving of the Lamport & Holt liner *Daldorch* last week, which had been ashore off Southport since November 22, H. & C. Grayson, Ltd., performed a notable feat with their oxy-acetylene plant. In efforts previously made to tow the vessel off the sandbank, a steel wire hawser broke and coiled round the propeller, causing the engines to be useless in further efforts at salving the ship. Messrs. Grayson were called in by the Liverpool Salvage Association, and with their oxy-acetylene plant succeeded in cutting away some 18 turns of this wire hawser between the boss of the propeller and the stern tube. With her propeller thus freed again, the *Daldorch* was able to give considerable help to the tugs, which eventually towed her into deep water, and afterwards she was able to proceed under her own steam to the Liverpool docks for discharge and examination.

BELFAST SHIPBUILDING AND SHIPPING.

(FROM OUR OWN CORRESPONDENT.)

Belfast.

There is little new to report in Belfast shipbuilding. Apprentices in one of the yards went on strike over a question of bonus last Thursday, but the affair soon fizzled out. There is no diminution in the activity which has prevailed for the past year, and although no announcement has yet been made, it is understood that the Christmas holidays will be materially curtailed. There has not been a merchant ship launched since October 21 and none will take place before the end of the year, so that the output for 1915 will not exceed 40,000 tons, exclusive of Government work. Very little progress is being made on merchant work at present, but it is possible that early in the coming year more attention may be directed to this class of ship.

THE FREIGHT MARKETS.

(FROM OUR OWN CORRESPONDENTS.)

London.

There is nothing to indicate a change in the rates on a general basis. There is even talk of a few better rates on the coast. Lack of tonnage is a hindrance to all operators, and another difficulty is the delay in discharging steamers at certain British and foreign ports. Both the United States, the Plate and the East India markets, and Northern Range charterers are steadily improving for tonnage. Stevedores also continue to time chartering, but no large volume of business is apparently passing. Less than a fortnight ago the Plate stood at 95s. home, but at the time of writing prompt tonnage for up-river ports to the United Kingdom may be quoted as worth anything up to 117s. 6d. At the close of last week the steamer *Carlos* was fixed for homeward loading at 112s. From the nitrate ports 100s. is offered to the United Kingdom or France, but without securing tonnage. Homeward from the North Pacific 150s. is to be had. For steamer *Ceres*, 21,000 tons, 10 per cent., has been taken up for Northern Range loading to the United Kingdom at 13s. 3d., with Irish ports at 13s. 6d., January 1-25. The *W. I. Radcliffe* loads at Baltimore, at 18s. for Marseilles, and is a 32,000-tonner, 10 per cent. boat. In the Eastern section, for kernels to Marseilles, the Madras Coast is worth about 116s. For a boat to load at Rangoon for Cuba 130s. would be paid. The idea prevails that some very remunerative freights will be obtainable for vessels to load at Vladivostok and Dalny. Australia to the United Kingdom ranges between 95s. and 100s. In time chartering for a 3,800-ton boat nearly 20s. has been conceded for nine months' transatlantic business States West Indies. Very high figures continue to be paid for vessels to load coal from the Tyne, but in connection with this business it is worth noting that for a period of two or three days there was no further advance in rates, except that for London the rate went to 16s. 6d. Leghorn stands at 60s., Nantes at 38s., Rouen at 27s., and Dunkirk at 26s. Other fixtures recorded are: Havre, 32s. 6d.; Caen, option Havre, 32s. 6d.; and Boulogne, 26s. Wear to Rochefort has been closed at 39s. Cardiff reports a strong market, a little quieter for South American destinations, but lively for Bay and Mediterranean ports. Fixtures reported include:—Oran, 58 fr.; Naples, 54s. 6d.; Dunkirk, 24s. 6d.; River Plate, 38s. 6d.; and Savona-Spezia-Leghorn, 60s. Liverpool to Copenhagen has been closed at 35s. to the Nerma. Grimsby to Treport has been done at 23s. 3d. for a prompt 1,000-ton boat.

Glasgow.

Although the outward coal rates were high during the greater part of the week and as much as 60s. was paid from Glasgow to Genoa, the demand was quieter latterly, owing to the difficulty experienced in stemming further tonnage. Owing to labour difficulties and the scarcity of railway wagons, the output of the collieries has been somewhat reduced, so that there is not the same amount of coal coming forward for export as usual. This has had the effect of lessening the demand for tonnage. Among the fixtures reported are the following:—Glasgow to Genoa, Savona or Leghorn, 4,000 tons, 60s., guaranteed terms; Troon to Genoa, 3,900 tons, 60s. 6d., guaranteed terms; Ardrossan to Bordeaux, 3,000 tons, 38-50 fr.; Glasgow to Bayonne, 2,250 tons, 45 fr.; and Cardiff to River Plate, 5,000 to 5,800 tons, 39s., December 8. Homeward markets were strong and, with no prospect of an improvement in the supply of tonnage rates, showed a tendency to advance. The River Plate paid 110s. for January, and 120s. was quoted for oats from Bahia Blanca home. American markets were rather inactive, the only fixtures being reported at 14s. 6d. to Rotterdam and 16s. to Northern France. In the East rates have been very firm. Burmah quoted 110s. to 115s. for February, while Bombay fixed at 81s. 3d. to the United Kingdom.

Newcastle-on-Tyne.

There is not a great deal of alteration in the position of the outward freight market as compared with a week ago, and the general tone continues to be very firm. An occasionally improved supply of tonnage has caused a certain amount of briskness in chartering and, though the volume of business actually transacted is anything but large, the list of fixtures has a more encouraging look than was the case last week. There is a very heavy demand for colliers, and, as the supply of steamers is quite inadequate to cope with requirements, rates continue to advance. Coastwise, London has reached the level of 16s. and is now firm on that basis.

For North France, Rouen has been heavily booked at from 26s. 6d. to 27s. 6d., an advance of from 1s. 6d. to 2s. on last week's figures; Havre is similarly increased; and Caen is about 2s. up; whilst Dunkirk has been done at slightly easier rates. Chartering for the Bay has been fairly brisk, with Bordeaux maintaining full recent rates and St. Nazaire being done at 2s. advance. In the Mediterranean market, Genoa has not attracted a great deal of attention, owing to a temporary "lock-out" declared by coal merchants, but 57s. 6d. has been paid for a 2,500-tonner, an advance of 5s. For Naples, 61s. has had to be conceded, and for Savona 60s. has been done twice. Rates now rule on the basis of 62s. 6d. for Genoa. In other directions, rates are correspondingly higher. Fixtures arranged since last report include the following:—Algiers, 3,000, 42s. 6d.; Bordeaux, 1,400, 36s. 6d.; 1,800, 37s. 6d.; 3,000, 38s. 6d.; Caen, 400, 26s.; Cherbourg, 1,500, 26s.; Dunkirk, 1,200, 24s. 6d.; Dieppe, 800, 26s.; Genoa, 3,200, 56s.; 2,500, 57s. 6d.; Havre, 1,200, 25s.; 1,500, 26s.; 1,200, 26s. 6d.; London, 2,600, 16s.; Marseilles, 2,900, 50s.; 2,500, 52s. 6d.; Malta, 3,300, 50s.; Naples, 5,000, 61s.; Oran, 2,200, 40s.; Porto Ferrajo, 4,500, 57s. 6d.; Rouen, 1,400, 26s. 3d., from Dunston; 1,400, 26s. 6d.; 1,850, 27s.; 600, 36s., coke; 2,500, 27s. 6d.; Rochefort, 1,500, 39s.; Savona, 6,000, 55s., full guarantees; 5,000, 60s.; 4,500, 57s. 6d.; St. Nazaire, 1,500, 34s. 6d.; 3,000, 38s.

Liverpool.

Outward freights on this market continue very firm, with tonnage in short supply to such an extent that business is very considerably restricted. Mediterranean rates are still soaring upwards, and are eagerly paid for ships that can be immediately berthed at the West Coast coal ports. Birkenhead has paid 32s. 6d. to Bordeaux, and Liverpool 57s. 6d. to Alexandria; but the market value of the latter is now nearer 60s., as, indeed, 61s. has been paid from Cardiff. Time charter rates are likewise appreciating, and there is still a steady demand for ships. The North Atlantic trade is now quoted 22s. 6d. to 23s. for six months, while two trips States to West Italy have paid up to 27s. 6d. In homeward freights there is the same story of stiffening rates and competition for tonnage. The Argentine has established a new record with 112s. 6d. paid San Lorenzo to United Kingdom for December-January, and charterers are still seeking tonnage at this figure. Bahia Blanca has also paid 105s. to United Kingdom for January. North America is still an active market, and Range ports hold firmly to the following rates for grain:—To United Kingdom, 13s. 3d. to 13s. 9d.; 16s. 3d. to French Atlantic; 17s. 9d. to Marseilles; and 19s. 6d. to West Italy. Flour Northern States to French Atlantic has also paid 85s., January. There is little else moving from the States homeward. Just now Eastern markets are very firm and compelled to bid for tonnage. Rice ports to United Kingdom quote 110s. (Saigon) and 115s. Burmah. Australia steady at 95s., which is unattractive, and Karachi worth 70s., while Bombay has paid 81s. 3d. one port, and 83s. 9d. two ports United Kingdom. Mediterranean and ore ports homewards are firm. From North Pacific 140s. is indicated, and 110s. from nitrate ports, and from Chili to United Kingdom with wheat. Sail freights outwards are still dull, but homewards rates are very firm, and ships are inquired for. Australia has paid 70s. home for December, and nitrate ports 76s. 6d. to United Kingdom for March-April.

Cardiff and Swansea.

A firm tone continues to pervade the freight market despite a somewhat freer offering of tonnage. A good inquiry still exists and while the market is, as a whole, "patchy," rates generally were well upheld, and in some cases advanced, Marseilles fixing at 65 fr., Gibraltar 33s., and Savona-Spezia at 60s. Altogether there was chartered from Cardiff last week vessels to carry 157,500 tons, a decrease of 5,150 tons when compared with the previous week's fixing. Mediterranean rates, owing to an urgent demand, were steadily maintained at Alexandria, 60s. 6d. and 61s. (500 tons delivery—a new record); Gibraltar, 32s. 6d. (three—500 tons delivery) and 33s. (a new record); Genoa with options, 56s. and 56s. 6d. (a new record); Huelva, 31s. 6d.; Lisbon, 30s. (400 tons delivery) and 30s. (500 tons delivery, twice—a new record); Marseilles, 65 fr. (a new record); Port Said, 55s.; Porto Ferrajo, 53s. (800 tons delivery); Savona-Spezia-Leghorn, 60s. (twice—a new record); Valencia, 34s. (twice). Bay and coasting business was comparatively slow, with rates a trifle below those ruling a week or so ago. Bordeaux was done at 41 fr. (three); Caen, 21s.; Havre, 20s.; London, 16s.; Nantes, 38 fr. (twice), 39 fr. and 37 fr. (twice); Rouen, 22s. (six), 22s. 6d., 21s. 6d. and 21s. 9d.; and St. Nazaire 38 fr. and 37 fr. The inquiry for South America was slow, with

rates steady on the basis of La Plata, 39s.; Monte Video, 39s. and River Plate, 39s. (twice), 38s. 6d. and 40s.; while the Canary Islands was represented by Las Palmas or Teneriffe being done twice at 30s. Chartering from Swansea was slow, only 30,100 tons being fixed, or 3,360 tons less than in the preceding week. Rates, however, maintained a firm tone. Huelva fixing at 32s. and Naples 52s. (a new record); Caen, 21s. 6d. and 21s. 9d. (a new record); Dunkirk, 23s., 24s., and 24s. 6d.; Rouen, 22s. 3d. (twice), 22s. (twice) and 22s. 6d. (twice); and Trouville, 22s. 6d. A comparatively large number of boats were fixed to load at Port Talbot on the basis of Bordeaux, 41 fr.; Nantes, 38 fr. and 37 fr.; Rouen 22s. 6d. and 21s.; St. Brieux, 23s.; St. Malo, 18s.; and Trepport, 23s. (twice).

Hull.

The market is in an unprecedented and remarkable position, with rates driven up to a very high level by the severe shortage of tonnage. In the Mediterranean direction as high as 60s. now quotes from Genoa or Savona from Hull, as compared with 48s. 6d., paid a fortnight ago; whilst to Alexandria 58s. 6d. to 60s. is quoting for Hull or Immingham loading. To the Bay ports 38s. rules for St. Nazaire and 38s. for Bordeaux from Hull. In the coasting branch rates are also very high, and business is checked on this account, as exporters are holding aloof. Rouen from Hull rules 26s. 6d. to 27s.; Rouen from Goole, 27s.; Dieppe from Hull, 25s.; and Dieppe from Goole, 25s. to 25s. 6d., according to size and position. To the River Plate a steady tone rules, but business is quiet at 38s. to 40s. for Buenos Ayres from Hull. Licences are readily available for coal cargoes for France, but difficult to obtain for Scandinavian destinations.

COMPANY REPORTS AND DIVIDENDS.

Griffiths Lewis Steam Navigation Company, Ltd.—The report for the period ended September 30 shows a net profit, before deducting interest, of £30,886, which was practically earned by two steamers out of the fleet of four vessels. A 20 per cent. dividend has been paid and £14,126 is now carried forward.

Union Steam Ship Company of New Zealand, Ltd.—Final dividend of 3½ per cent. on the ordinary shares making a total distribution of 6 per cent. for the year. A final dividend of 2¾ per cent. on the preference shares will also be paid. With the interim dividend paid on May 31 this will make a distribution of 5½ per cent. for the year on the preference shares.

Cairn Line Steamships, Ltd.—The directors announce that owing to a large number of the staff having joined His Majesty's forces there may be some delay in completing the accounts for the year ending December 31. Therefore they have decided to pay a further interim dividend of 5 per cent. (actual), free of income-tax, on January 1, 1916. This makes a total of 20 per cent., free of income-tax in respect of the present financial year, as against 10 per cent. for the last financial year and for the year previous. The directors announce also that their steamer *Cairnalt*, which has been detained at Petrograd since the beginning of the war, has been sold as she lies at a satisfactory price.

Hochseefischerei Bremerhaven A.G.—This company pays no dividend for 1914-15. The gross profit for the year amounted to £2,360 (£20,200), to which was added £710 (£265) brought forward; after deducting £4,050 (£9,500) depreciation there remains this year a loss of £975 as against a net profit of £11,000 in the previous year. Last year 7½ per cent. dividend was paid; this year the loss is covered from reserve. The low allowance for depreciation in 1914-15 is held to be justified by the fact that most of the vessels have been laid up all the year, whilst prices of ships have risen 25 per cent. Suspension of fishing has practically paralysed the company's ice-making business.

Khedivial Mail Steamship & Graving Dock Company, Ltd.—The trading profit for the year to June 30, including Government subsidies, and after charging insurance of steamers and all expenses, amounted to £53,384, and after deducting debenture and loan interest, depreciation, &c., and the balance of cost of debenture issue, together £33,653, the net profit was £19,731. Adding the balance brought in and deducting the preference dividend for half-year ended June 30, 1914, paid in May last, there remained £28,633. Since the date of the accounts, one year's dividend, to June 30, 1915, on the preference shares has been paid, and the directors now recommend a dividend at the rate of 5 per cent. on the ordinary shares, leaving £12,637 to be carried forward. During the major portion

of the period under review the greater part of the company's regular services had perforce to be suspended owing to the state of war with Turkey. Many of the steamers thus rendered idle were, however, requisitioned for Government work, while others have been profitably employed in home waters.

Northern Steamship Company of Russia.—This company made a loss of 249,619 r. in its 15th (1914) working year. In the preceding year the company paid a dividend of 5 per cent..

Stettiner Oderwerke A.G. fur Schiff und Maschinenbau.—This company is about to distribute 5 per cent. dividend. Shareholders representing £40,000 were present at the general meeting.

G. Seebeck A.G. Schiffswerft, Maschinenfabrik u. Trockendocks (Geestemunde).—From a net profit of £17,900 (£10,400 last year) this company is paying 8 per cent. (nil) dividend on preference shares. The balance carried forward is increased from £10,400 to £11,650. It is proposed to write down the original capital by combining shares in the ratio of 3:1. The privileges of preference shareholders are to be curtailed and the minimum holdings of directors revised.

Geestemunde Herings u. Hochseefischerei A.G.—This company is very badly hit by the war. The financial year 1914-15 (July 1, 1914, to May 15, 1915) yielded £1,300 (£5,400) gross profit. After writing off £4,650 (£4,200) depreciation; £1,660 (£940) interest; and £835 (£1,160) general charges, there remains a loss of £7,180 as against a profit of £590 last year. During the fishing season, before the outbreak of war, the fleet produced 4,692 (9,638) tons of packed herrings, which fetched 34s. 6d. a ton.

Aktiengesell. Oberbilker Stahlwerk (formerly Poensgen, Giesbers & Cie.).—This company again pays 6 per cent. dividend on its preference shares and transfers £7,340 to current account, making the total reserve £41,700. The working surplus is given as £67,900 (£72,500); charges and interest, £23,800 (£25,000); depreciation, £32,000 (£35,500); net profit, £11,750 (£11,400). Buildings are written down to £382,000 (£412,000); goods in hand are valued at £47,600 (£57,200); cash, bills, &c., £70,500 (£52,200); debts, £78,800 (£107,200); turnover, £355,000 (£482,000). The business has suffered by the war and about half the staff and workmen are mobilised.

COMPANY REGISTRATIONS.

North End Motor Fishing Company, Ltd.—Capital, £2,000, in £1 shares. Objects, to take over the business of motor and other boat and vessel proprietors carried on at Grimsby as the "North End Motor Boat Syndicate." Registered office, Fish Dock Road, Grimsby. Private company.

George Traill & Sons Shipping, Ltd.—Capital, £15,000, in £1 shares. Objects, to carry on the business of shipowners, shipping agents, loading brokers, &c. G. Traill, carrying on business as "George Traill & Sons," is the first manager. Registered office, 63, Fenchurch Street, E.C. Private company.

Leadenhall Steamship Company, Ltd.—Capital, £20,000, in £1 shares. Objects, to carry on the business of shipowners, ship and insurance brokers, managers of shipping property, and freight contractors. Signatories (who appoint first directors), W. McAllum, 24, St. Mary Axe, E.C., and D. P. McAllum, 61, Station Road, Winchmore Hill, N. Private company.

Port St. Mary Fishing & Curing Company, Ltd.—Capital, £50,000 (40,000 7½ per cent. part preference shares of £1 each and 20,000 deferred shares of 1s. each). Objects, to carry on the business of fishermen, owners of steam or other fishing vessels. Minimum cash subscription 10,000 part preference shares. First directors include W. B. Styer, 11 and 12, Fenchurch Street, E.C.

M. & R. Steamship Company, Ltd.—Capital, £50,000, in £10 shares. Objects, to carry on the business of shipowners, shippers, ship loading, insurance, passenger and general brokers, managers of shipping and other property, and to adopt an agreement with A. T. Miller and F. E. Richards. Miller & Richards, shipbrokers, of London, are managers. Registered office, Sussex Place House, 87A, Leadenhall Street, E.C. Private company.

Capricornus Steamship Company, Ltd.—Capital £45,000 in £1 shares. Objects, to take over the ss. *Ribstone* and to carry on the business of shipowners, ship and insurance brokers, underwriters,

managers of ships and shipping property, &c., and to adopt an agreement with the Owners of S.V. *Eda*, Ltd. First directors: G. H. C. Moller, managing director, and G. A. Craggs, Secretary, G. Bostock. Registered office: 21, Leamington Lane, E.C. Private company.

Stathe Steamship Company, Ltd.—Capital, £30,000 in £10 shares. Objects, to adopt an agreement with J. S. Rees and W. K. Griffin for the registration of the ss. *Thames* and *25* with the said vessels trading as "J. S. Rees and Griffin" relating to management, to carry on the business of ship and tug owners, ship and loading brokers, shipping agents, &c. J. S. Rees and W. K. Griffin are the directors and sole managers. Registered office, 12, West Bute Street, Cardiff. Private company.

Swift Steamship Company, Ltd.—Capital, £10,000 in £1 shares. Objects, to adopt an agreement between the Canadian North-West Steamship Company, Ltd., of Toronto, and Hessler & Co., of West Hartlepool, and to carry on the business of shipowners in all its branches. First directors, J. K. M. Hessler and H. W. Casper, with power to appoint two others. J. K. M. Hessler, trading as "Hessler & Co.," is the first managing director, with £250 per annum. Qualification, £500 shares of stock. Private company.

ORDERS PLACED.

The Koninklijke Nederlandsche Stoomboot Maatschappij has ordered a 440 by 64 by 31-ft. cargo steamer of 10,300 tons capacity and 12 knots, from the Droogdok Maatschappij, Rotterdam.

The Coastwise Transportation Company, of Boston, has ordered a 12,000-ton steamer from the New York Shipbuilding Company, of Camden, N.J., with which it has already contracted for six boats of somewhat smaller size.

The Bull Insular Steamship Company, New York, is reported to have placed an order with the Maryland Steel Company for two single-deck cargo steamers. This order is distinct from the three boats already placed by the A. H. Bull Steamship Company with the same builders.

An order for two oil tankers, 475 ft. in length, is reported to have been booked by the Harlan & Hollingsworth Corporation, Wilmington, Del. The owners are the Standard Oil Company, of New Jersey. A similar order has been placed with the Maryland Steel Company.

The Kawasaki Dockyard Company, Kobe, are to construct two merchantmen to the order of the Odessa Mercantile Marine Company. The Russian company is reported to have approached the Osaka Shosen Kaisha with a proposal to purchase some of the company's vessels.

Det Bergenske Dampskibsselskab, of Bergen, have contracted with a Copenhagen firm for the building of two twin-screw shelter-decked motor vessels of 3,800 gross tons and 6,500 tons d.w. each, for delivery in 1919. The motors will be of the latest direct reversible type, with six cylinders. All the other machinery is electrical. The vessels are intended for the South American trade.

An order for a 4,000-ton single-deck steamer with topside tanks for coastwise service has been placed with the Great Lakes Engineering Works, Detroit, by the owners of the steamer *Morris Adler*, now being completed at Ashtabula, O., to replace this boat, which has been sold at a substantial profit over the contract price to Norwegian owners represented by Houlder, Weir & Boyd, New York.

MANUFACTURING AND INDUSTRIAL NOTES.

There are over 80,000 bales of wool stored in the Mersey Docks and Harbour Board's warehouses.

Dock labourers at Glasgow are demanding 1d. per hour advance all round on their present rates, with additional allowance for special classes of work.

It is proposed by the Works Committee of the Mersey Dock Board to reconstruct the southernmost section of the shed on the east side of the Harrington Dock at an estimated cost of £16,885. The shed was recently destroyed by fire.

His Majesty's Consul at St. Vincent reports that certain British cargo has been delivered from the German steamer *Heimbürg*, lying at that port. Arrangements have also been made for the delivery of British cargo from the steamer *Wurzburg*, another German vessel at St. Vincent.

NEWS PARAGRAPHS.

Koninklijke Nederlandsche Stoomboot Maatschappij.—This company will shortly issue preference shares limited to purchasers of Dutch nationality in order that the national character of the undertaking may be preserved.

Hamburg Cuxhaven Fischdampfer A.G. "Alte Liebe."—It has now been decided that the directors of this company receive expenses and a fixed remuneration of £350 a year, in addition to the share of profits as laid down in the company's articles.

Allowances to Employees.—Mr. Justice Peterson has confirmed an alteration of the Pelton Steamship Company's articles of association, to enable it to make grants or allowances to employees and their dependants and to make contributions to charitable funds.

Steamship Services to Dieppe. The *Board of Trade Journal* states that the London, Brighton & South Coast Railway Company have decided to discontinue the Littlehampton cargo service to Dieppe for the present. At the same time the company notify that the service from the London Docks to Dieppe has been resumed.

"Restraint of Princes." The House of Lords has reserved judgment in the appeal of the British & Foreign Marine Insurance Company, Ltd., v. Samuel Sanday & Co. This case raises the very important issue whether the restraint of princes clause applies to cargoes diverted to British ports when the war broke out.

Carriage of Dangerous Goods in Ships.—The Board of Trade "Memorandum relating to the Carriage of Dangerous Goods (other than explosives) in Ships" has been issued in revised form and with considerable additions. Copies may be purchased either directly or through any bookseller, from Wyman & Sons, Ltd., Fetter Lane, London, E.C., price 3d.

Safety of Life at Sea.—The Board of Trade announces that the coming into operation of the Merchant Shipping Convention Act, 1914, which embodied the proposals of the International Conference for the Safety of Life at Sea, has now been postponed until July 1, 1916. The Act should have come into effect on July 1 last, and was postponed last May until January 1 next.

Canalisation of the Maas.—The Dutch Government has decided on a general scheme for canalising the Maas from Maasbracht to Grave. Work will first be undertaken on dams and locks between Linne and Roermond. The largest locks will be 350 ft. in length and capable of accommodating a tug and two 2,000-ton barges. The smaller locks will be 360 ft. in length, taking a single 2,000-ton vessel.

Old Hamburg Steamer Lost.—The *Uranus* ran aground at Hafsloe (Karlskrona), whilst on a voyage from Hamburg to Stockholm laden with coal and machine parts, and broke up during a heavy storm. This vessel was said to be the oldest sailing from Hamburg. She was built at North Shields in 1870, and was called the *Bamborough* till purchased by A. Kirsten. Her tonnage was 892.558, and her engines of 480 i.h.p.

A Suspended German Service.—It is announced that German ferryboats will no longer make the 30 mile crossing between Gjedser and Warnemünde, but the Danish vessels will maintain a reduced service. This withdrawal of German boats is due, presumably, to our submarine activity in the Baltic and, as the Gjedser-Warnemünde line runs across the Fehmarn Belt opposite Lubeck Bay and right across the Baltic approach to Kiel, this is a rather interesting and significant item of news.

New Northern Route.—The Copenhagen correspondent of the *Daily Telegraph* states that the Swedish Government intends as soon as possible to establish a Northern European world route connecting the West of Europe with Russia via Malmo or Gothenburg, Stockholm, Kappelskar and Finland, thus avoiding the transit of Germany. A Bill embodying the scheme will be submitted to the Swedish Riksdag when that body meets again in a short time. The scheme includes the construction of a very large harbour at Kappelskar.

Russian Shipping and Loans.—The Congress of shipowners in the Chernomorsk-Azoff region, on the question of navigation premiums, has pronounced itself in favour of the introduction of protection with conditions, obviating the possibility of fictitious transfer of foreign vessels to the Russian flag. The Congress urges the establishment of a bank for making loans against security of

Russian ships, and also the provision of such loans by the Imperial Bank, as the proposed prohibition of orders for Russian ships being sent to foreign houses will make such loans particularly desirable.

West African Freights Raised.—The African Steamship Company and the British & African Steam Navigation Company announce an increase of 5s. per freight ton, beginning with the sailing on December 15, in the rates on cement, coal, fuel, salt (in 90-lb. bags or over), shooks, and rough timber. Salt shipped in smaller bags will be charged a further 2s. 6d. per ton, but no salt will be accepted for shipment in bags weighing under 20 lb.

Russian Ships in Foreign Ports.—The Ministry of Trade and Industry has announced to the owners of steamships under the Russian flag sailing foreign waters as follows:—1. Captains of such ships during the war are forbidden to transfer coal shipped for the use of their vessels in neutral ports without permission of the Russian Consul or, in his absence, in the presence of the consul of an Allied Power. 2. During the loading of coal in Russian and Allied ports, the captains must submit to the conditions established by the local authorities, and give such guarantees as may be considered necessary by them with respect to the purpose of the coal.

A War Salvage Claim.—In the Admiralty Court last week the owners of the steamship *Balakani*, of London, claimed remuneration for salvage services rendered to the derelict barque *William T. Lewis*, of Glasgow, which the *Balakani* towed into Berehaven on September 5. The rescuing ship saw a submarine while undertaking towage, and eventually, after completing her task, herself struck a mine and went down, members of her crew being drowned when the ship was lost. Her total crew was 34. It was argued that she might have missed the mine had she neglected the derelict. His lordship awarded half the value of the salvaged property to the salvors, which worked out at £5,250.

The End of a German Shipyard.—The Elbe shipbuilding firm of Schenk & Co. was founded in 1905, failed just before the outbreak of war, and has now been sold up. According to *Hansa* the end of this undertaking is in the best interests of German shipbuilding, since the firm was founded with inadequate capital and cut prices to an extraordinary degree in order to get business. Plenty of work was secured, but with inadequate margin of profit and often actual loss. The firm obtained credit for £40,000 on insufficient security from the Elbinger Vereinsbank, and the end came in the summer of 1914. After several unsuccessful efforts, the yard has been sold for £3,750 to a firm in Ludwigshafen. The new owners do not intend to carry on shipbuilding.

Turbine Blade Materials.—The firm of F. Schichau, Elbing, communicated to the recent annual meeting of the Schiffbautechnische Gesellschaft a lengthy report on investigations with materials, particularly turbine blade materials. The influence of manufacturing processes and the relative merits of various methods of construction were considered as well as the influence of heat treatment and the loss of strength at steam temperatures. Tensile and bending tests were performed on individual blades, and complete segments of blading were also tested. The report states that cover strip blading is superior to wire connection and that blading by segments is much better than individual blading. The report also includes data concerning investigations on white metal bearing alloys.

A Stettin Centenary.—The shipbuilding firm, Nüscke & Co., of Stettin, recently celebrated the centenary of its foundation and published a souvenir booklet for the occasion. According to *Hansa*, this is a stimulating treatise of superior production and profusely illustrated. It contains the family tree of the Nüsckes who have been established in Stettin and connected with maritime work since 1650; it also contains tables and illustrations relating to vessels built during the past 100 years, but the *pièce de resistance* is a history of the yard written by Dr. Altenburg. The largest vessel built by the yard so far is the recently launched 4,000-ton ss. *Stettin*, but the brochure closes with the favourite Teutonic hope "that in the hard-won, well-deserved, happy peace to come, German shipbuilding will embark on a golden era."

Supply of Coal.—The Board of Trade call attention to the probability that, owing to the increasing consumption of coal in the industrial areas and the reduced output from the mines, due to the enlistment of miners, it will become necessary for many industrial consumers to draw their supplies to some extent from districts other than those on which they have been accustomed to rely. In order to maintain a regular and uninterrupted flow of coal it is recommended that industrial consumers should wherever

possible contract for their requirements and not trust to the open market. Colliery owners on their part will, it is hoped, assist by making contracts for as much of their output as they can feel reasonably sure of maintaining. In view of the situation as indicated above, it may be necessary for the Coal Exports Committee, from time to time, further to restrict the recommendation of licences in the case of coals which are in general demand for home consumption.

Königsberg Activity.—The Uniongiesserei is extending its yards to deal with medium size steamers of 600 tons or so dead-weight engaged in Baltic traffic. New vessels will be built at Continen. A new floating dock is under construction and the Pregel is being dredged for its accommodation.

Norwegian Yard Extension.—The Eriksbergs mek. Verksted (Gothenburg) has important extensions in hand. Land has been purchased giving a total water frontage of 1,410 ft. Three new slipways are being laid down so that the yard will have five slips and be able to build vessels up to 18,000 tons capacity. New shops will be erected to serve the additional slipways.

Rosenberg Engineering Works.—In consequence of the active demand which has sprung up for new shipping the Rosenberg Engineering Works, Stavanger, have decided to establish a shipyard capable of building ships up to 12,000 tons. The programme also includes the construction of a dry dock for vessels of the same size as the largest boats of the Norwegian-American Line. The capital will be increased to about £200,000.

German Heroes and Ship Names.—The Norddeutsche Lloyd's new cargo and passenger steamer, building at Danzig, and sister ship to the *Columbus*, is to be called the *Hindenburg*. The two cargo steamers of 12,200 tons register, recently ordered by the firm of Hugo Stinnes, Mülheim, are to be christened *Hindenburg* and *Ludendorff*, and two similar vessels building at Flensburg for the same owners will be named *Tirpitz* and *Hafenstein*.

Telefunken System Superseded.—Twenty-two oil tank steamers, formerly belonging to the German company of the Standard Oil Company, but transferred to the American register since the war, have now been fitted out with Marconi wireless apparatus in place of the Telefunken gear with which they were formerly equipped. The contract for the new equipment is for a term of years. There are now 47 Standard Oil tankers with Marconi wireless sets.

American Coal at Seville.—The American Consul at Seville reports that local buyers purchased some time ago two sample shiploads of coal from the United States, but when the first shipment arrived it was wet and extremely slack, and in consequence it became difficult to secure orders for American coal. One coal dealer informed the Consul that as a sample shipment its effect was almost disastrous, and has resulted in a prejudice against American coal which it will be difficult to overcome.

Shooter Island Shipyard.—The Standard Shipbuilding Corporation has been organised, with a capital of \$3,000,000, to take over the shipyard at Shooter Island, between Staten Island and Bayonne. Among the directors are Messrs. Herbert A. Ayres, William B. Coolidge and Edward A. Clark, of Boston; Edward A. Faust, of St. Louis; Colonel Moses Schoenberg, Herman C. Stifel, of St. Louis; and Wallace Downey, formerly of the firm of Townsend, Downey & Co., which originally operated the property on Shooter Island.

Oil Vessels in the Argentine.—The *Boletín Oficial* (Buenos Ayres) of September 30 publishes the text of Regulations made by the Argentine Prefect-General of Ports specifying the requirements to which vessels intended for the transport and distribution of petroleum in the ports and jurisdictional waters of the Republic must conform. The maximum quantity of oil allowed to be carried in such vessels is 500 tons. The hull and the other parts of the boat must be of iron or steel and its construction must conform to the regulations of Lloyd's Register or the Bureau Veritas. The full text of the Regulations referred to (in Spanish) may be consulted by United Kingdom shipowners and shipbuilders interested at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, London, E.C.

Shipping Speculation in Norway.—The *Frankfurter Zeitung* comments on the "veritable shipping fever" now raging in Norway, under the influence of which innumerable small shipping companies are being founded despite the warnings of the press and experienced commercial men. The procedure seems to be for the speculator-in-chief to hunt up a few old vessels which would be considered fit

only for breaking up in normal times. A company is then formed, the shares are sold at a premium, and the person who is organizing the scheme sells his collection to the company at many times its real value. Practically working may be possible under existing abnormal conditions, but the ultimate fate of the bubble companies is a foregone conclusion. The present recklessness of investors in trusts is very inextricably with the difficulty which was experienced in raising capital for the Norway America line.

Mechanical Coal-Loading Plant. According to the *Engineering* is a new type of coal-loading plant built for the Southern Railway at Charleston, S.C., by the Welmann, Seaver-Morgan Company, Cleveland, Ohio. The coal is mechanically loaded into the ship instead of being allowed to flow by gravity. This type has the advantage of little breakage of coal, while the plant need not be so large as the gravity type. A movable car dumper of standard type is used to empty the trucks into the hopper of the movable loading tower, which is of 100 tons capacity. Thence the coal is taken by a conveyor through a curved arm extending over the boat, at the extremity of which it falls through a telescopic chute into the hold. The arm can be adjusted as to vertical height and horizontal extension for boats of different size. There is also a trimmer of the Blake rotating type operated by a motor at the side of the chute. The conveyor, of the scraper type, has a capacity of 3,600 tons per hour. The plant can handle thirty 100-ton trucks per hour. It is entirely electrically driven and requires three men to operate it.

Important Judgment in Engineer's Compensation Claim.—At the Cardiff County Court on Monday His Honour Judge Hill Kelly delivered judgment in the case in which Percy Gibb Revely, Chief Engineer of the steamer *Fornebo*, claimed compensation under the Workmen's Compensation Act from the Fornebo Steamship Company, Ltd., in respect of injuries received. The point at issue was as to whether a chief engineer could be regarded as a workman within the meaning of the Act. His Honour explained that persons employed otherwise than for manual labour, and whose wages exceeded £250 a year, were excluded. In this case, however, he held that it had been proved as a fact that a substantial part of the applicant's employment was that of manual labour, in the performance of which he met with the accident, and which was not simply incidental or accessory to the work of supervision—the ordinary work of a chief engineer. And the owners were cognisant of this fact, as the full complement of engineers had not been engaged. His Honour, therefore, held that the applicant, in view of the work which he performed, came within the Act, and gave judgment for the applicant with costs on Scale B.

British Wrecks Reported in November.—The number and net tonnage of British vessels respecting the loss of which reports were received at the Board of Trade during the month of November, 1915, and the number of lives lost, are as follows:—

Description.	Number.	Net Tonnage.	Lives Lost.
Sailing ..	35	1,977	6
Steam ..	23	61,727	644
Total ..	58	63,704	650

Including 1 steamer of 48,721 tons sunk by German warships, 10 steamers of 4,974 tons sunk by mines, and 1 steamer of 861 tons sunk by a German warship or by a mine.

Including 99 lives lost in steamers sunk by German warships, of which 315 were lost in the *Rosario*, and 197 in the *Matoppe*, 58 lives lost in steamers sunk by mines, and 20 lives lost in a steamer sunk by a German warship or by a mine.

The figures include the losses of 13 sailing vessels of 1,897 tons and 5 steamers of 362 tons belonging to British possessions abroad, involving the loss of the lives of 10 persons, all of whom were lost in sailing vessels. Casualties not resulting in total loss of vessels, and the lives lost by such casualties, are not included.

Submarine Lost through Faulty Rivet.—The loss of the submarine *F-4* in Honolulu harbour last March, with all on board, was primarily due to the corrosion of a rivet in one of her ballast tanks, according to the report of the naval board which investigated the disaster. The board is satisfied that the condition of the vessel and her apparatus, as found after she was recovered, tell with approximate completeness the story of her fatal plunge. The board is a unit in the opinion that the corrosion of the rivet in a ballast tank permitted sea water from the tank to penetrate to the exterior of the submarine's storage batteries and thence to the interior of the tank. As the sea valves of the tank were open as usual, additional waters entered the hull of the *F-4*, probably to the extent of several tons. This caused the submarine to sink, the board believes,

while the generation of chlorine gas resulted from the action of the salt water upon the sulphuric acid of the batteries. It is believed that not more than five minutes altogether, and probably less, elapsed between the moment of the first sign of trouble and the culmination of the disaster.

Excess Profits Referees. Mr. Duke, K.C., will be the Chairman of the Court of Referees to hear appeals in connection with the excess profits duty. It includes members representing the various industries of the country, and amongst these are Mr. Leif Jones, M.P. (Lloyd's), Mr. J. A. Jones (Cardiff and Newcastle shipping), and Sir W. Peat and Mr. Joseph Gurney Fowler (shipping accountants).

Cost of New U.S. Battleships.—Tenders have been opened at Washington for the construction of the hull and engines of battleships Nos. 43 and 44, authorised this year. Although nominally all of the offers were within the limit of \$7,800,000 prescribed by Congress, and a little below that in some cases, private contractors attached conditions to their offers which the Navy Department fears will bring the actual cost above the figure of authorisation. However, the tenders of the Government yards were all within the limit, and these provided for complete construction in accordance with the Department's specifications. In these circumstances it seems probable that the New York Navy Yard, with its two contract prices of \$6,987,667 and \$7,069,923, will receive the contract for one of the ships. However, the New York yard is now at work on the *California*, which will occupy it for a year more. The New York Navy Yard figures were: For turbine engines, \$7,069,923; for steam and electric drive (similar to the plant designed for the *California*), \$6,986,667. Philadelphia yard:—Turbine, \$6,916,427; electric, \$6,774,144. Mare Island yard:—Turbine, \$7,413,156. Private tenders were as follow, each being accompanied by letters modifying the specifications and eliminating material and machinery to be supplied by the contractor:—New York Shipbuilding Company: Turbine drive, \$7,700,000; time, 34 months. Newport News Shipbuilding Company: (a) Turbine (as specified), \$7,775,000; time, 40 months; (b) turbine (alternative type), \$7,765,000; time, 40 months. Fore River Shipbuilding Company: Turbine \$7,638,000; time, 34 months. Alternative tenders, with increasing eliminations in equipment, grade of steel, &c., (a) \$7,684,000 (b) \$7,750,000 (c) \$7,229,500; time, 34 months in each case. New hull construction due to plans to lessen the danger from torpedo attack occasioned some of the increase. Several offers, however, rejected the stipulation that changes in bulkhead construction could be made by the Government at any time within three months after the contract award, should new information on the subject be obtained. Tenders for armour for the new ships, opened on the same day, showed little increase in price since the last armour contracts were awarded. The Carnegie Company was the low bidder for the first-class armour for both ships at \$425 a ton.

Coal Consumption v. Panama Tolls.

The Ellerman & Bucknall steamship *Matoppe*, which arrived at Balboa on November 1, on the way from San Francisco for London, cleared from Balboa on Saturday, November 6, after taking on 900 tons of coal from the Panama Railroad, and proceeded by way of the Strait of Magellan. According to a statement by her first officer, she uses about 36 tons of coal a day and makes about 10 knots an hour, and on this basis a writer in the *Canal Record* makes the following comments:—

"The distance from Balboa to London by way of the Strait of Magellan is about 11,500 miles, which would mean approximately 48 steaming days. The coal she took at Balboa will last her 25 days, or slightly over half the voyage.

"The 900 tons of coal taken at Balboa cost the ship \$6,300. Had she been able to go through the Canal her tolls, at \$1.20 per ton on 4,476 net tons, Panama Canal measurement, would have been \$5,371.20. The coaling for half of the long voyage cost more than the Canal tolls would have been. To go from Cristobal to London would require about 19 days for the *Matoppe*, with a coal consumption of 684 tons, costing, at \$7 a ton, \$4,788. To have gone through the Canal, tolls and coal would have aggregated \$10,000, if the coal had been bought at Balboa, which would have been at least \$2,500 cheaper than the voyage through the Strait of Magellan, on the cost of coal alone. And if the Canal had been open the vessel could have secured coal at Cristobal for \$1 less per ton, which would have increased the saving on fuel to over \$3,000."

FAR EASTERN SHIPPING.

The following extracts from recent Consular reports throw light on the influence of war on shipping in the Far East. Excepting where stated they are taken from the reports on trading conditions during 1914:—

JAPAN.

In Japan in the closing months of 1914 and the opening months of this year there has been such a demand for space for exports and such a scarcity of tonnage that shipping companies find themselves in the position of having to shut out quantities of cargo.

In order to indicate clearly the effect which the war produced on shipping, the following table has been compiled so as to show the number of steamers entered up to the time when war was declared and at the close of the year:—

Year.	January 1 to July 31.		Whole Year.	
	Vessels.	Tonnage.	Vessels.	Tonnage.
1912	5,202	12,596,625	8,957	21,633,818
1913	5,712	11,959,033	9,888	21,638,574
1914	5,966	15,582,647	9,451	20,554,182

It will be seen that up to the end of July there was, as might have been expected from the experience of previous years, a small but steady increase. But as soon as war broke out the German and Austro-Hungarian flags naturally vanished from Japan ports, while a good many British, French and Japanese ships were requisitioned by their respective Governments and were taken off their regular routes. Taking it on the whole, and considering the exceptional circumstances, shipping to and from Japan has been wonderfully free from interruption, and similarly, inward and outwards cargoes have been singularly lucky in escaping misadventures caused by war. The troubles arising from cargoes on enemy ships at neutral ports and lying at Tsingtao come of course under a different category.

Taking the figures for the whole year the Japanese flag shows an advance from 6,229 steamers and 12,529,552 tons to 6,307 steamers and 12,711,905 tons, while British shipping, which occupies the next place on the list, has only dropped by about 7 per cent. from 2,166 ships of 7,228,460 tons in 1913, to 1,875 ships of 6,697,859 tons last year. American shipping, which now comes third, has only 184 ships of 1,286,400 tons to its credit. It will be perhaps best to deal separately with the different services.

On the Pacific the most interesting event prior to the war was the break up of the conference with regard to tea and silk and the cutting of rates to a very low level. With the outbreak of war the fine new Canadian Pacific Railway boats were immediately requisitioned by the Government and commissioned as auxiliary cruisers while the other boats of this company were also taken over by the Government, so that for the rest of the year this well-known company had none of their steamers on the service, although they came locally to a working arrangement with the Russian volunteer fleet, whereby occasional trips were made to Canada by Russian boats. The large General Steam Navigation steamer *Minnesota* was also temporarily withdrawn. The services of the three Japanese companies and of the Pacific Mail Steamship Company were maintained without interruption, while the Blue Funnel boats also ran more or less according to their regular time table.

The service to Europe was naturally more interfered with than any other, as the disappearance of the Norddeutscher Lloyd, Hamburg-Amerika, Rickmers and Austrian Lloyd boats made a great difference, and the number of steamers available for this route was materially reduced. At first the nervousness caused by the shock of war, the high insurance rates and the difficulties of finance stopped business so effectively that the first ships to clear from Yokohama, after war was declared, took very little cargo, and the lack of tonnage was not noticeable in early autumn; but as things improved and business developed in produce and all kinds of exports the demand for space grew enormously, and shippers are now clamouring to book space ahead. The question of the increase of freights has been very much to the fore, and it has now (March, 1915) been decided by the Government that the Nippon Yusen Kaisha shall be allowed to raise their rates of freight on certain articles. But in spite of the Nippon Yusen Kaisha putting three extra steamers on the European run, the demands for space having grown so great and rates having been put up all round by other companies at other ports, the Japanese Government finally decided that it was better to agree to an advance in freights than for shippers to lose business through being unable to secure space.

Unfortunately on the European line although there is, as stated above, a superabundance of export cargo there is not anything like a corresponding amount of cargo with which to fill the ships on the return voyage. In the case of the Australian service it is different—exports to Australia have been plentiful, while imports from the Commonwealth have also been large.

Business in marine insurance was entirely dominated by the war. Owing to complaints received soon after hostilities opened that insurance companies were charging prohibitive rates, the Japanese Government launched in September a Government war risk scheme. Companies permitted to make use of the scheme were Japanese companies as well as foreign companies registered in Japan. Under this arrangement the Japanese Government assumed 80 per cent. of all risks under policies issued in accordance with the regulations pertaining thereto. In contrast, however, with the British scheme, the Japanese Government were not to receive any proportion of the premium, the insurer thus paying to the insurance company only the premium necessary to cover the risk actually taken by the company, and obtaining protection for 80 per cent. of his policy for nothing. After some discussion on minor points, the companies decided to make use of the scheme which, whilst it curtailed profits, minimised the risk of large losses. Although it was thought at first that the rates fixed by the Government were too low and that serious losses might be incurred by the Government, results have shown that the losses have been slight.

The only other point to notice during the year is the probability of an arrangement by which the lighters at Kobe will have to secure a certificate from the Imperial Marine Association before craft risk will be accepted. Negotiations on this point have been going on for some time between the Japanese and foreign companies, and it is understood that an agreement has been reached. In addition it is proposed that the Imperial Marine Association shall be entrusted with the duty of surveying the cause or causes of damage to lighters or cargo in case of accidents occurring in Kobe Harbour.

FORMOSA.

In the aggregate 1,273 steamers of 2,524,415 tons entered Formosan ports during 1914 against 1,324 vessels of 2,533,937 tons in 1913. Whereas, however, the tonnage from Japan (coasting trade) increased by just over 102,000 tons, that from foreign countries, showed a decline of over 113,000 tons. British shipping declined from 37 vessels of 124,329 tons to 20 vessels of 63,602 tons, and German shipping from 10 vessels of 25,797 tons to 1 vessel of 2,056 tons. Doubtless the war had some effect in reducing totals, but foreign shipping to Formosan ports is by no means regular, so that it is difficult to estimate the exact influence, especially as the principal neutral flag showed a decline (United States 65,280 to 40,651 tons). Foreign shipping has steadily decreased in recent years; the reservation of the trade between Japan and Formosa to Japanese shipping as coastwise traffic, and subsidy to various foreign-going lines, places the Japanese flag in too favourable a position for much competition. There is no regular foreign line at all, such boats as do come being only to get shipments of tea, bunker coal or on charter with machinery, &c.

Subsidies to Japanese lines remained the same as the previous year, £103,510 for 15 steamers making altogether 29 trips monthly to various points—Japan, Hong-Kong, Canton, Tientsin, &c. The only change (from January 1, 1915) is that the two steamers on the Tamsui-Hong-Kong line now run on to Keelung, thus facilitating the transshipment of goods from Japan to Hong-Kong and Southern China ports and making easier the handling of heavy cargo by the superior equipment of Keelung Harbour.

COREA.

The returns of the shipping which visited the open ports of Corea in the year 1914 indicate a decrease of 626 vessels but an increase in tonnage of 220,547 tons. Some 97 per cent. of the total shipping is Japanese, 4,408 steamers of that nationality (tonnage 4,061,838) having entered in 1914.

The Korean Mail Steamship Company (Chôsen Yûsen Kaisha) opened a semi-monthly service between Shimonoski and Vladivostok, via Fusan, Gensan and other ports in October, 1914, and the same month a steamer of 472 tons net belonging to the same company began to ply between Chemulpo and Chefoo, to call when possible at Dairen, the service being extended to Tsingtao at the beginning of 1915. Two new ships, the *Keiki Maru* and *Zenra Maru*, each of 563 tons net, built at the Osaka Ironworks, were added to the fleet in October and November respectively, and placed on the run between Moji and Yuki (Ungki) via Fusan.

Owing to the stagnation in imports during the last five months of the year, the China Navigation Company was compelled to withdraw its steamer from the Korean run, the last visit to Chemulpo being in November, but when Antung is again open to trade in the spring of 1915 it is expected that the service will be resumed.

The following vessels complete the list of foreign steamers which visited Corea :—

	Vessels.	Tonnage.
Russian	6	2,041
Norwegian	5	13,463
German	2	7,933
Dutch	1	1,255

The following rates are quoted on vessels which are overdue or on which extra premium is considered necessary :—

	Gns.
<i>I. d. v.</i>	10
<i>I. d. v.</i>	90
<i>I. d. v.</i>	50
<i>I. d. v.</i>	92
<i>I. d. v.</i>	25
<i>I. d. v.</i>	70

(Including losses incidental to the war).

Vessel.	Tonnage.	Owner, Builders and Year Built.	Casualty.
Aghios Nikolaos, ss.	2,231	N. Valmas, Syra. J. Readhead & Co., S. Shields. (1887.)	Dec. 6 : Ashore west coast Greece.
Boileau, ss.	1,680	Delmas Freres, La Rochelle. Palmers Co. Newcastle. (1884.)	Nov. 25 : Swansea for St. Nazaire. Feared she has foundered.
Brynhiild, ss.	1,179	R. H. Frick, Svenska K. Anstaden, Stockholm. Kisti Boells & Co. Sunderland. (1882.)	Dec. 1 : Stockholm for Rauno. General cargo. Wrecked off Gusslehanna.
Cian Macleod, ss. . .	1,796	Cox & E. Irvine & Co., Glasgow. Furness, Wigham & Co., West Hartlepool. (1903.)	Dec. 4 : Reported "sunk."
Colenso, ss.	861	I. Wilson Sons & Co., Hull. R. Stephenson & Co., Newcastle. (1900.)	Dec. 1 : Reported "sunk." Crew saved.
Dorita, ss.	3,689	Emil R. Retzlaff, Stettin. W. Hamilton & Co., Pt. Glasgow. (1894.)	Dec. 6 : Emden for Stockholm. Cargo coal. Ashore off Fatselort.
Dotterel, ss.	1,366	Cork S.S. Co., Cork. Swan, Hunter & Wigham Richardson, Newcastle. (1904.)	Nov. 30 : Reported "sunk."
Framfield, ss.	2,510	Woodfield S.S. Co. (Woods, Tylor & Brown), London. J. Priestman & Co., Sunderland. (1894.)	Nov. 29 : La Goulette for Stockton, cargo iron ore; wrecked near Newcome. Captain and crew saved.
Haakon Adalstein, ss.	711	Nordlandske Dampskibs. Trondhjelm Mitchell & Co., Newcastle. (1873.)	Dec. 1 : Ashore north of Bergen. Much damage.
Langton Hall, ss. . .	4,437	Ellerman Lines (Hall Line, Ltd.), Liverpool. Swan, Hunter & Wigham Richardson, Newcastle. (1905.)	Dec. 3 : Reported "sunk." Crew saved.
Logie, ss.	891	Belfast S.S. Co., Belfast. Barclay, Curle & Co., Glasgow. (1898.)	Dec. 1 : In collision with coasting steamer <i>Monroe</i> in Crosby Channel.
Middleton, ss.	2,506	Alexander S.S. (Capper, Alexander & Co.), Hull. W. Gray & Co., W. Hartlepool. (1895.)	Dec. 4 : Reported "sunk" in Mediterranean.
Minnesota, ss.	20,718	Gt. Northern S.S. Co., New York. Eastern S.B. Co., New London, Conn., U.S.A. (1904.)	Dec. 6 : Considerably damaged by explosion in machinery. Lying off Coronada Islands.
Norrbotten, ss.	8,011	Rederi Aktieb. Luleå-Ofoten (P. A. Welin), Stockholm. Hawthorn, Leslie & Co., Newcastle. (1912.)	Dec. 1 : Narvik for Philadelphia. Cargo iron ore. Reported missing.
Orange Prince, ss.	3,583	Prince Line (J. Knott), Newcastle. Tyne Iron S.B. Co., Newcastle. (1894.)	Dec. 1 : Reported "sunk."
Queen Margaret, ss.	3,000	Ed. Dunlop S.S. Co. (T. Dundas & Sons), Glasgow. R. Duncan & Co., Pt. Glasgow. (1912.)	Dec. 6 : Grounded on rocks at Cape Race. Much damage.
Reina Maria Christina, ss.	4,818	Cia. Trasatlantica, Barcelona. W. Denny & Bros., Dumbarton. (1888.)	Dec. 3 : Reported ashore off Lowry Rocks. Lighthouse.
Sigurd, ss.	1,000	Akties. Skoglands Linje (T. H. Skoglund), Høugesund, Howaldtswerke, Kiel. (1891.)	Nov. 23 : New York for Scandinavia. Feared wrecked.
Socotra, t.ss. . . .	6,000	P. & O. S.N. Co., London. Palmers Co., Newcastle. (1887.)	Nov. 25 : Ashore off Paris Plage. Broken in two.
Star of New Zealand, ss.	4,417	Star Line (J. P. Corry & Co.), Belfast. Workman, Clark & Co., Belfast. (1895.)	Dec. 4 : Montevideo for Havre, with mails and cargo, frozen meat. Wrecked near Molene. Feared total loss.
Umata, ss.	5,312	British India S.N. Co., London. A. Stephen & Sons, Glasgow. (1914.)	Dec. 7 : Reported "sunk."
Zaritis, ss.	2,004	I. Zanti, Metaxades, M. L. L. Co., Commercial Co.), Piræus. W. Pickersgill & Sons, Sunderland. (1901.)	Dec. 2 : Reported "sunk." Crew saved.
Zuara, ss.	1,303	Conti, Giorgi & Co. (L. E. Contifu A.), Genoa. Caird & Purdie, Barrow. (1882.)	Dec. 3 : Destroyed by fire whilst loading petroleum at Papville, Vittoria Emanuele Dock.

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"SHIPBUILDING AND SHIPPING RECORD" TABLE OF SHIP SALES.

Name and type.	Tonnage.	Dimensions. Draught in ()	Sold by, to	Builders, hull and year.	Machinery and builders.	Remarks.
Agios Georgios, ss. (ex <i>Saint Irene</i>)	3,197 gr. 2,028 net. 5,660 d.w.	354' x 47½' x 22½'	G. Nicolaou & J. A. Cosmetto Svia, to Norwegian buyers	A. McMillan & Son, Dumbarton (1904)	24, 40, 65 x 40 (Dumbarton & Jackson, Glasgow)	Price about £95,000. Sold in Jan., 1914, for about £23,150.
Alden, ss.	3,768 gr. 2,340 net. 6,210 d.w.	344' x 49' x 25' (21½')	Kjaer & Isdahl, Bergen, to Damps. Ostlandet (Trvggve Sogen), Christiania	J. Priestman & Co. Sunderland (1907)	24, 40, 66 x 45 (J. Dickinson & Sons, Sunderland)	Price about 2,000,000 kr.
Annavore, ss. (well dk.) (ex <i>Wally</i>)	1,855 gr. 1,084 net.	270' x 39½' x 19' (19½')	Akties. Annavore (Lundegaard & Stray), Farsund, to A. Simonsen, Haugesund	North of England S.B. Co., Sunderland (1883)	27, 58 x 42 (N.E. Mar. Eng. Co., Sunderland)	
Antonio, ss. (plawning dk.) (ex <i>Firby</i>)	2,422 gr. 1,438 net. 3,350 d.w.	290' x 42' x 17½' (19½')	Uribe y Eguirraun, Bilbao, to Norwegian buyers	W. Gray & Co., W. Hartlepool (1895)	22, 35, 59 x 39 (Cen. Mar. Eng. Works, W. Hartlepool)	Price about £45,000. Sold in April, 1909, for about £11,250.
Asturias, ss.	1,185 gr. 741 net.	274½' x 35½' x 16½'	Dampskibsselskab Garonne (Fearnley & Eger), Christiania, to Harald Hanssen, Skien	Nylands Vaerksted, Christiania (1905)	16½, 27, 44 x 32 (Nylands Vaerksted)	Price about £37,000.
Bygland, ss.	2,344 gr. 1,465 net. 4,010 d.w.	295' x 45' x 19½'	Akties. Dpsk. Bygland (Sv. Svenningsen), Arendal, to Bergen buyers	Short Bros., Sunderland (1905)	22½, 37, 61 x 42 (N.E. Mar. Eng. Co., Sunderland)	Price about £55,000.
Elorrio, ss. (ex <i>King Edgar</i>)	2,485 gr. 1,514 net.	304' x 44' x 20½'	Cia. de Nav. La Estrella (Juan L. Prado), Bilbao, to buyers not stated	Short Bros., Sunderland (1896)	23, 37½, 61½ x 39 (Blair & Co., Stockton)	Price about £55,000.
Greta, iron ss. (well dk.) (ex <i>Roseville</i>), re-named Norvik	1,633 gr. 990 net.	257½' x 35½' x 17½' (19½')	Rederiaktieb. Hella (P. L. Pahlsson), Helsingborg, to C. Henningsson, Norrköping	W. Gray & Co., W. Hartlepool (1881)	29½, 60 x 39 (Blair & Co., Stockton)	Price about £22,500.
Hatholmen, s.v. (ex <i>Paul Isenberg</i>)	1,220 gr. 1,142 net. 1,930 d.w.	226' x 36½' x 21½' (20½')	O. Lohne, Mandal, Norway, to J. Bryde, Sandefjord	C. J. Bigger, Londonderry (1888)		Price about £7,500. Sold in April, 1907, for about £3,700.
Hero, ss.	1,714 gr. 1,081 net.	268½' x 38½' x 17½'	Kjaer & Isdahl, Bergen, to Damps. Ostlandet (Trvggve Sogen), Christiania	Laxevaags Msk & Jernskibs. Bergen (1903)	19½, 31, 51 x 33 (Laxevaags Msk. & Jernskibs)	Price about 800,000 kr.
Hornelen, ss.	3,766 gr. 2,413 net. 6,205 d.w.	344' x 49' x 25'	Kjaer & Isdahl, Bergen, to Damps., Ostlandet (Trvggve Sogen), Christiania	J. Priestman & Co. Sunderland (1906)	24, 40, 66 x 45 (G. Clark, Sunderland)	Price about 2,000,000 kr.
Jolaseta, ss. (well dk.) (ex <i>Nith</i>)	2,284 gr. 1,489 net. 3,610 d.w.	290' x 38' x 19½' (21½')	Sanchez, Pereiro, Bengoechea y Cia., Bilbao, to Norwegian buyers	Withy & Co. W. Hartlepool (1888)	21½, 35, 59 x 39 (T. Richardson and Sons, Hartlepool)	Price about £39,000. Sold in August, 1914, for about £8,250.
Kapunda, ss.	3,097 gr. 1,970 net. 4,150 d.w.	330' x 45' x 21½' (21½')	Melbourne S.S. Co., Melbourne, to Liverpool buyers	W. Gray & Co., W. Hartlepool (1908)	25, 41, 68 x 48 (Cen. Mar. Eng. Works, W. Hartlepool)	
Lady Wolseley, ss., re-named Kinvarra	1,424 gr. 729 net. 1,530 d.w.	275' x 35' x 16½'	British & Irish Steam Packet Co., Dublin, to Limerick S.S. Co.	Naval Con. & Arm. Co., Barrow (1894)	25½, 40, 65 x 42 (Naval Con. & A. Co.)	
Manx King, s.v.	1,729 gr. 1,596 net. 2,660 d.w.	251' x 39' x 24' (22')	J. Johannesen, Mandal, to buyers not stated	Richardson, Duck & Co., Stockton (1884)		Price about £10,250.
Pacific, ss.	4,210 gr. 2,612 net. 7,400 d.w.	370' x 53½' x 24½' (23½')	W. H. Cockerline & Co., Hull, to Jas. Chambers & Co., Liverpool	Sunderland S.B. Co. (1914)	25, 42, 68 x 48 (Blair & Co., Stockton)	Price about £101,000.
Quito, ss. (spar dk.)	3,358 gr. 2,153 net. 5,560 d.w.	330½' x 45½' x 16½' (22½')	Bank Line (A. Weir & Co.), Glasgow, to Tom Lewis, Cardiff	W. Hamilton & Co., Pt. Glasgow (1900)	21, 40, 65 x 42 (Dumbarton & Jackson, Glasgow)	Price about £55,000. Sold last August for about £42,000.
Rakiura, ss. (ex <i>Hamilton</i> , ex <i>Burma</i>)	3,569 gr. 2,204 net.	344½' x 44½' x 23½'	Akties. The Fremantle Whaling Co. (Chr. Nielsen & Co.), Larvik to Kragerø buyers	W. Denny & Bros., Dumbarton (1896)	23, 37, 60 x 54 (Denny & Co., Dumbarton)	Price about £83,500.
Ramsholm, ss. (well dk.) (ex <i>Ramfos</i> , ex <i>Phoenix</i> , ex <i>Joseph John</i>)	2,172 gr. 1,350 net. 3,210 d.w.	280' x 38½' x 18½'	Joh. Henriksson, Haugesund, to Johannesen & Agdesteen, Bergen	W. Denny & Sons, Sunderland (1889)	21, 35, 57 x 39 (W. Denny & Sons)	Price about £33,500. Sold in April, 1915, for about £16,000.
Uppland, ss.	2,407 gr. 1,518 net. 4,010 d.w.	305' x 45½' x 20' (19½')	Rederi Akt. Uppland (T. Persson), Helsingborg, to Norwegian buyers	W. Gray & Co., W. Hartlepool (1904)	22½, 36½, 62 x 39 (Cen. Mar. Eng. Works, W. Hartlepool)	Price about £67,000.
Wray Castle, s.v.	1,937 gr. 1,791 net. 2,900 d.w.	264' x 39' x 23½' (21½')	J. B. Walmsley & Co., Liverpool, to R. Thomas & Co., Liverpool	R. Williamson & Son, Workington (1889)		

one towards shares of a high nominal value, the other towards shares of a low value. Royal Maids and Furness Withys are probably the most prominent representatives of the two groups. Cunard shares spring into activity periodically, but it is rarely that business attains the same dimensions. Peninsular & Oriental shares have been very quiet even in the midst of the active business in other shares. The revival of the old method of issuing a very abbreviated form of accounts has not been received with favour, and it is probable the question may be raised at the meeting. The Union Steamship Company has announced a final dividend of 13½ per cent. for the year ended September 30. This compares with 2½ per cent. at the same time last year and brings the total distribution for the year up to 6 per cent. as against 5 per cent. for 1914. It is curious that, although in the shipbuilding industry is likely to benefit for many years to come from the demands of European and our own shipping companies, the public interest has not yet been attracted to the shares.

SHIPPING AND PACKS

[illegible]

IRON AND STEEL.

Name.	Share and paid.	Extremes quotations, 1913.	Last ann. div. % or per share.	Yield. %	Quotation, July 30, 1914.	Cash price during week.	
Babcock & Wilcox	Ord	£ 69½-56/3	14	6½	28-28½	24	
Baldwins	Cum. pref.	22/6-21/3	5½	5½	1½-1½	1½	
Do.	Deb.	Stk. 100½-100½	4½	4½	97-99	98½	
Bayless, Jones	Cum. pref.	-	5	7½	8	11	
Bel Bros.	Cum. pref.	10	12½-11	6	5½	11½-12½	
Do.	Deb.	Stk. 98-96½	4	4½	96-98	96-98	
Bessemer (Henry)	Ord.	1	1½-1½	10	6½	12-1½	1½
Bolkow Vaughan	Ord.	1	22½-19½	4	6½	1½-1½	1½
Do.	Cum. pref.	20	21½-20-5	5	5½	20-21	19½
Cargo Fleet Iron	Ord.	1	11 10½ 7 6	2½	3	14-14½	14
Do.	Deb.	100	91-88½	4½	5	89-92	89
Consett Iron Co.	Ord.	1	88/6-74/6	12½	14	34-32	24½
Dorman Iron & Steel	Bds.	100	100-88½	8	7½	84-87	74½
Dorman, Long	Ord.	1	21/6-16/9	8	7½	27-26	1½
Do.	Deb.	Stk. 88½-86½	4	4½	87-90	84½	
Ebbw Vale Steel & Iron	Ord.	1	18-16½	12	14	24-21	24
Guest, Keen & Ntelflds	Ord.	1	68 9-61/3	15½	5	34-34½	3½
Do.	Cum. pref.	5	3½-3½	5	12½	5½-5½	5½
Do.	Deb.	Stk. 100½-95	4	4½	96-98	80½	
Hadfield's Steel Foundry	Ord.	1	63½-58 9	22½	6½	3-3	3½
Hawthorn (R. & W.) Leslie	Ord.	10	13-12	10	7½	13½-13½	12½-13½
Do.	Deb.	5 (4 pd.)	7-5½	7½	4	6-6½	4
Jessop (W.) & Sons	Ord.	1 (1 pd.)	68-65	15	5½	63-65	7½
Lanarkshire Steel	Cum. pref.	1	7½-8½	5	5½	5½-6½	7½
Lysaght (J.)	Cum. pref.	1	27/6-25-	8	5	11-12	1½
Do.	Deb.	Stk. 108½-102½	4½	5	104-106	-	
Manganese Bronze	Ord.	1	-	6	11	8-8	8
Do.	Cum. pref.	1	1-8	6	6½	4-1	4
North-Eastern Steel	Deb.	Stk. 89-92	4½	-	-	-	-
Palmer Ship & Iron "A"	Ord.	1	16-14/6	7	10½	8½-9	4
Scott (Walter)	Ord.	1	86-82	4	4½	81-82	86-91
Do.	Deb.	Stk. 18-14	12½	6	18-14	1½	1½
Sheffield Forge	Ord.	1	1½-1½	5	5½	93-98xd	94½
Shelton Iron & Steel	Deb.	100	99½-96	5	8	1½-1½	1½
S. Durham Steel & Iron	Ord.	1	35/-23 6	10	8	1½-1½	1½
Do.	Cum. pref.	1	20 6-19-6	6	5½	1½-1½	1½
Do.	Deb.	Stk. 9½-98	4½	4½	90-92	90-92	
Steel Co. of Scotland	Ord.	10	12½-8½	5	5½	8½-9	8½-9½
Stewarts & Lloyds	Pref. ord.	10	21½-20	10	5½	20-21	19½
Do.	Cum. pref.	10	14½-13½	6	4½	11½-13½	13½
Stone (J.)	Cum. pref.	10	9½-9	5	5½	8½-9½xd	8½
United States Steel	Ord.	100½	71½-50	3	3½	61-61½	91
Do.	Cum. pref.	100½	113-104½	7	5	112-113	122½
Vickers Ltd.	Ord.	1	43/6-33 3	2½	7½	1½-1½	1½
Do.	Pref.	Stk. 106½-99	5	4½	104-107	92	
Do.	Deb.	Stk. 106½-91½	4	4½	96½-98½	83½	
Weardale Steel	Deb. ord.	1	21-17-	6	7½	8-12	1½
Do.	Cum. pref.	1	20 1½-18-	6	6½	1½-1	1½
Do.	Deb.	Stk. 77-73½	4	5	77-80	77	80
Workington Iron & Steel	Ord.	1	16/6-12/3	4	5½	12-12	12

SHIPBUILDING AND MARINE ENGINEERING.

Armstrong, Whitworth	Ord.	1	64 — 34	12½	6	13½ — 2½	1
Do. ... Cum.	pref.	5	95 — 84 6	4	6½	4 8 — 4 8	3½
Do. ... Deb.	Stk.	100	98 — 94½	5	6½	96 — 98	8½
Beardmore (W.)	... Deb.	100	90½ 91½	4½	3½	94 — 96	8½
Brown (John)	... Ord.	1 (158, pd.)	23 — 17 9	12½	9½	— — —	—
Do. ... Cum.	pref.	10	10½ 9½	5	6½	99 — 100	8½
Cannell Land	... Ord.	5	54 — 27	7½	7½	38 — 41	4½
Do. ... Cum.	pref.	5	92½ — 79½	5	6½	4 — 4½	3½
Do. ... Deb.	100	90½ — 84½	4½	5	92 — 94	—	8½
Dunlop (Jas.)	... Ord.	1	18 6 — 17 6	Nil.	—	— — —	—
Do. ... Cum.	pref.	1	18 — 8	0	7 8	8 — 1	—
Fairfield Shipbldg	Cum. pref.	10	10 — 7 8	6	8 8	—	—
Fleming & Ferguson	Ord.	10	20 — 12½	10	7½	14½ — 14½	14½
Gray (Wm.)	... Deb.	100	100 — 100	4½	4½	100 — 102	100
Henderson (D. & W.)	Cum. pref.	1	8 — 19	5	8½	— — —	—
Richardsons Westgarth	Ord.	1	9 8 — 4 3	Nil.	Nil.	— — —	—
Do. ... Cum.	pref.	1	9 8 — 4 3	Nil.	Nil.	— — —	—
Do. ... Deb.	Stk.	100	100 — 88	1½	6½	55 — 58	60½
Simons (W.)	... Cum.	pref.	10	10 — 10	5	14½ — 16½	9½
Stephenson (R.)	... Ord.	1	66½ — 63	Nil.	Nil.	—	—
Do. ... Deb.	Stk.	100	66½ — 63	Nil.	Nil.	—	—
Swan, Hunter & W. R.	... Ord.	1	19 10½ — 16½	11½	10½	1½ — 1	—
Do. ... Cum.	pref.	1	19 10½ — 17 9	5	5	1½ — 1	—
Do. ... Deb.	Stk.	100	90½ — 88	4½	4½	90 — 93	90
Thornycroft (John I.)	... Ord.	1	27 6 — 12 6	8	8	— — —	—
Do. ... Cum.	pref.	1	19 3 — 11 3	6	7 8	— — —	—
Do. ... Deb.	100	94 — 91	5	5½	88 — 92	93	—
Walstead Shipway	... Ord.	1	1½ — 1½	10	—	18 — 1½	—
Do. ... Cum.	pref.	1	20 — 20	5	—	13 — 1½	—

* With arrears.

† Includes 21 bonus

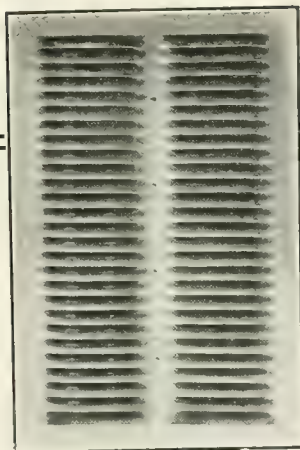


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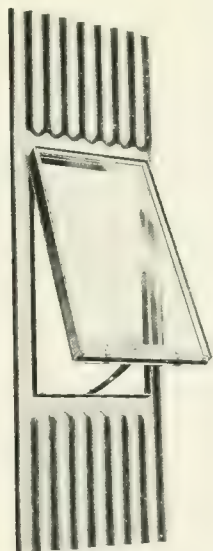
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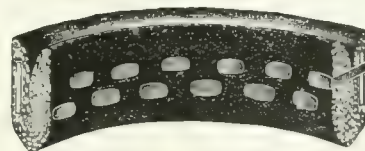
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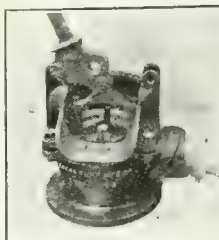
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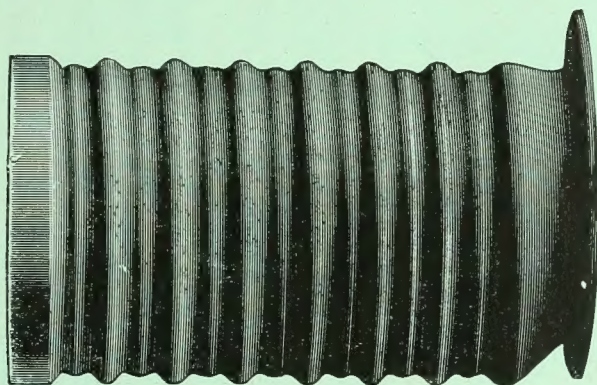
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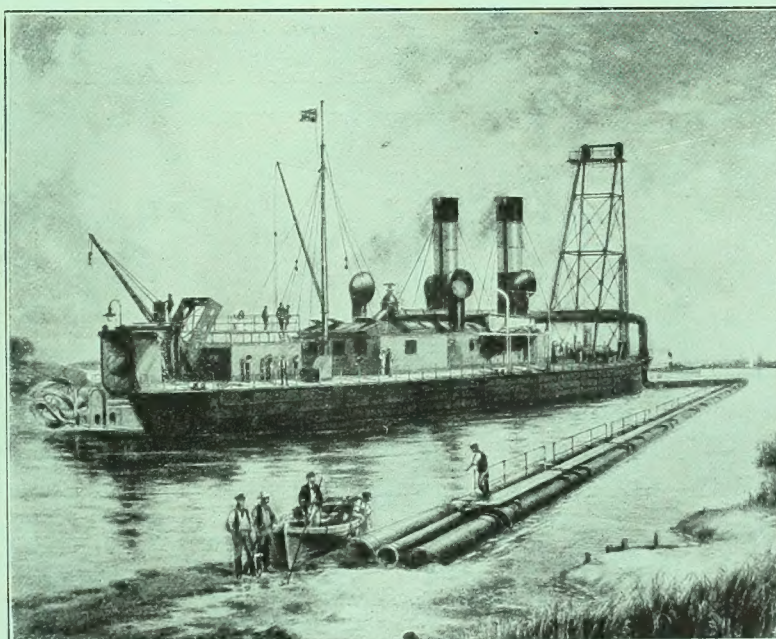
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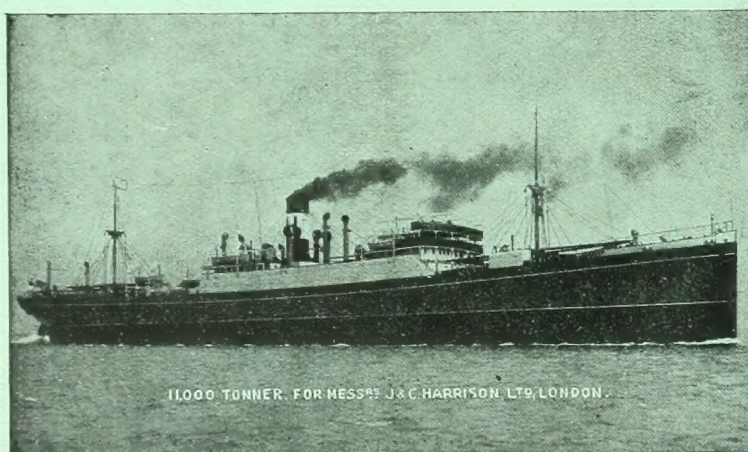
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